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United States Patent [19]

Ozaki et al.

[11] **Patent Number:** 5,933,478[45] **Date of Patent:** *Aug. 3, 1999[54] **DATA TRANSFER SYSTEM AND HANDHELD
TERMINAL DEVICE USED THEREFOR**

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Kokubunji, all of Japan

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[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

[21] Appl. No.: 08/534,318

[22] Filed: Sep. 27, 1995

[30] **Foreign Application Priority Data**

Sep. 28, 1994 [JP] Japan 6-233226
Mar. 23, 1995 [JP] Japan 7-064288

[51] Int. Cl.⁶ H04M 11/00

[52] U.S. Cl. 379/93.24; 379/100.08;
379/93.23; 379/90.01; 455/412; 455/38.4

[58] Field of Search 379/96, 93, 97,
379/98, 100, 110, 90, 56, 57, 58, 59, 90.01,
93.17, 93.23, 93.24, 100.08, 100.14; 358/442,
400, 401, 402, 407, 434, 468; 340/825.44;
455/412, 413, 556, 557, 575, 31.1-31.3

[56] **References Cited****U.S. PATENT DOCUMENTS**

4,764,951 8/1988 Kotani et al. 379/100.14
5,200,988 4/1993 Riskin 379/96
5,291,302 3/1994 Gordon et al. 379/100.08
5,315,642 5/1994 Fernandez 379/96
5,392,452 2/1995 Davis 455/460
5,422,733 6/1995 Merchant et al. 379/58

5,426,594 6/1995 Wright et al. 379/96
5,463,382 10/1995 Nikas et al. 455/38.1
5,487,100 1/1996 Kane 379/96
5,493,692 2/1996 Theimer et al. 379/57
5,495,344 2/1996 Callaway, Jr. et al. 455/38.4
5,530,740 6/1996 Iribarrent et al. 379/93.24
5,561,703 10/1996 Arledge et al. 379/58
5,568,536 10/1996 Tiller et al. 379/58
5,604,788 2/1997 Tett 379/96

FOREIGN PATENT DOCUMENTS

6-6302 of 1994 Japan .
6-978787 of 1994 Japan .

OTHER PUBLICATIONS

"Toragi Computer", vol. 5, No. 7, Jul. 1993, pp. 84-92.

Primary Examiner—Stella Woo

Attorney, Agent, or Firm—Antonelli, Terry, Stout & Kraus,
LLP

[57] **ABSTRACT**

In the handheld terminal device, when a message reception unit receives from a host computer a new arrival message indicating a new arrival of a file (or electronic mail), a control unit analyzes the new arrival message to obtain identifier information for identifying the file (or electronic mail) and a telephone number of the host computer. After a line connection to the host computer is established by a handheld phone transceiver unit, a fetch request command for fetching the file (or electronic mail) is transmitted to automatically fetch the file (or electronic mail) from the host computer and make the user know the contents of the file (or electronic mail) by using a display unit. A FAX transmitting user designates a destination handheld terminal device and transmits FAX image data to a communication server (CS). CS stores the received FAX image data and transmits a FAX arrival message to a pager connected to the destination handheld terminal device. A user of the handheld terminal device informed of a FAX arrival by the pager confirms the FAX brief image data contained in the message, and if necessary, calls CS by a handheld phone connected to the handheld terminal device to make CS transmit the FAX image data and refer to the detailed contents thereof.

24 Claims, 32 Drawing Sheets

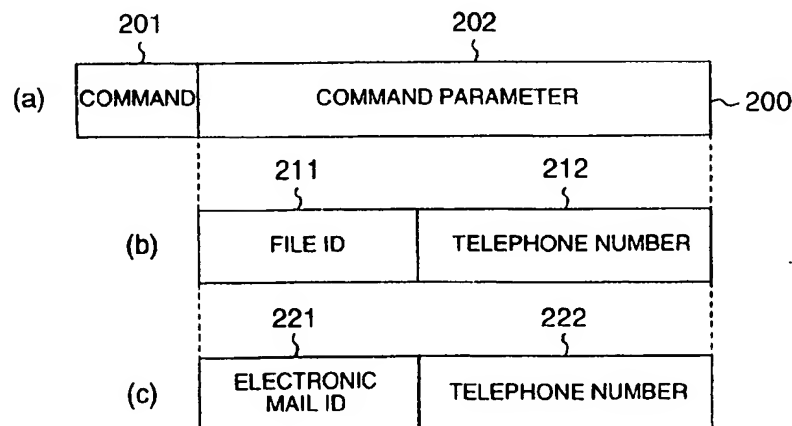


FIG. 1

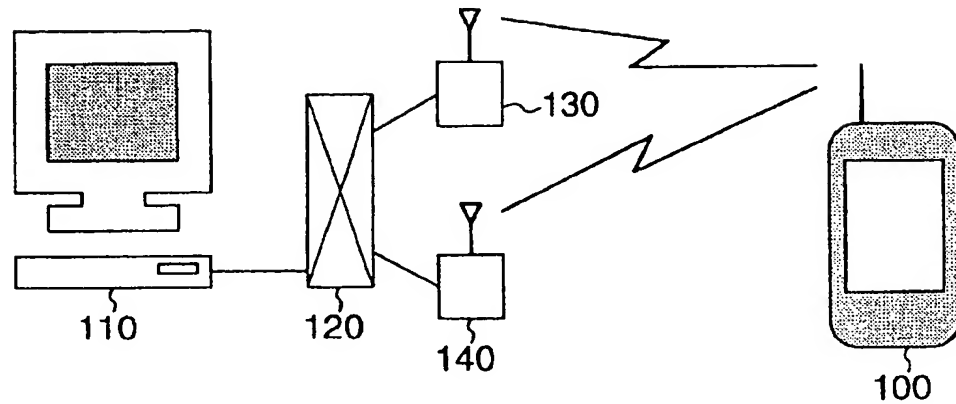


FIG. 2

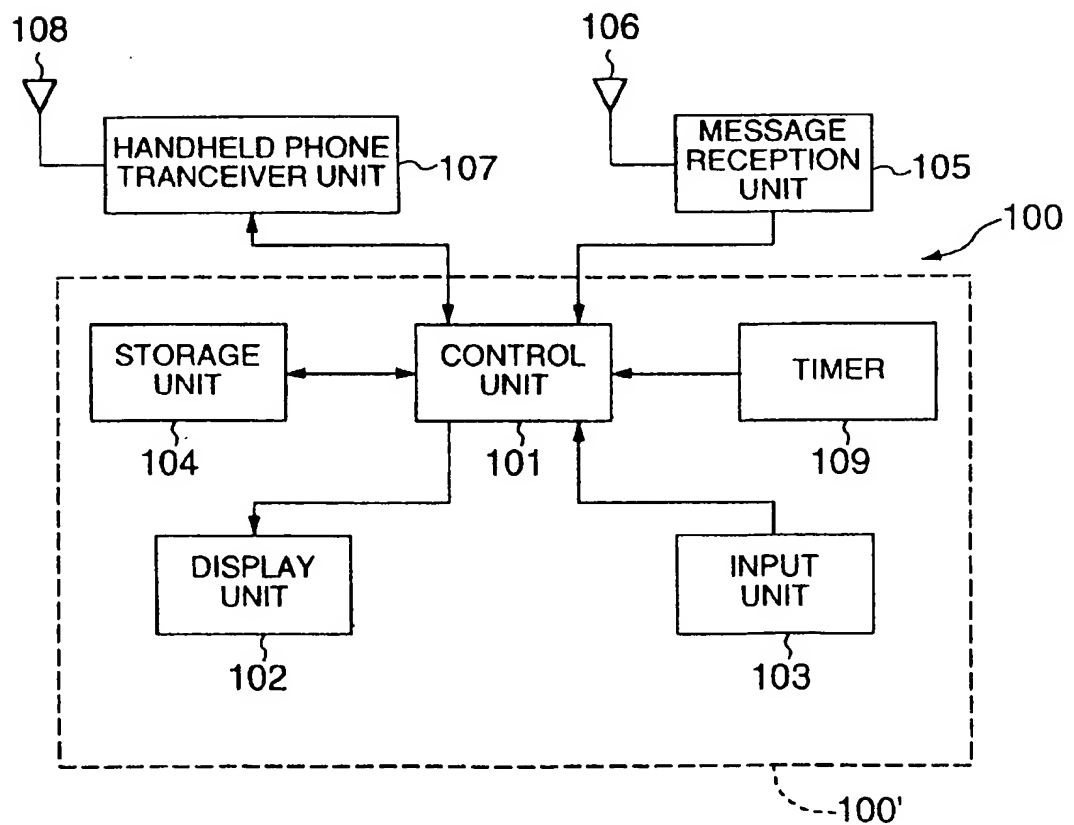


FIG.3

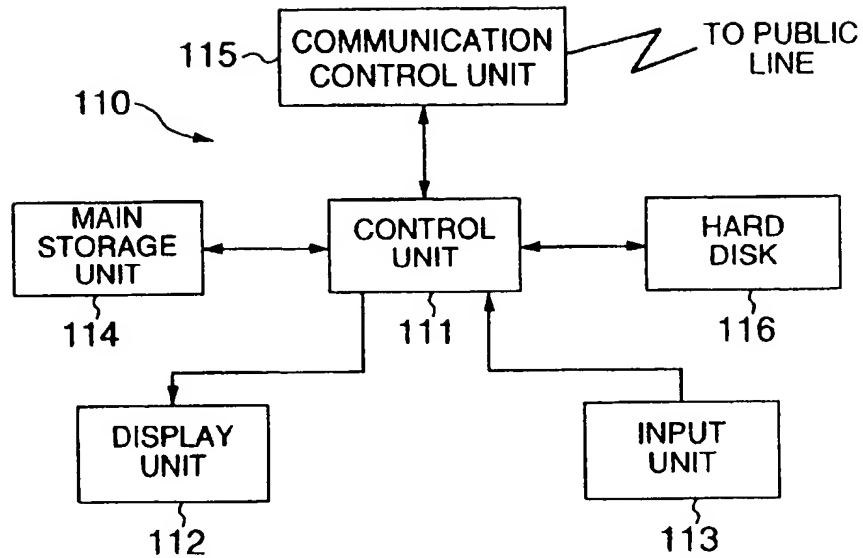


FIG.4

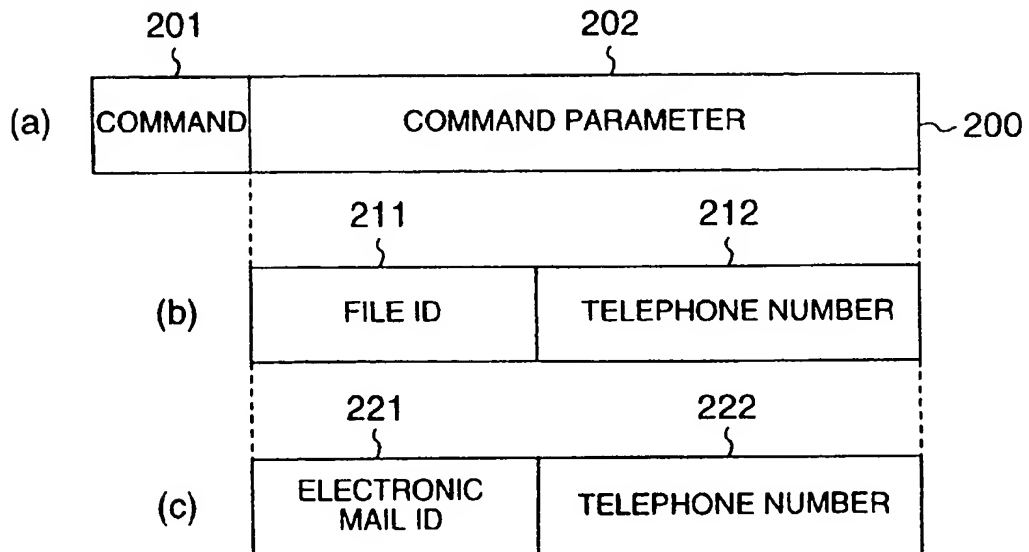


FIG. 5

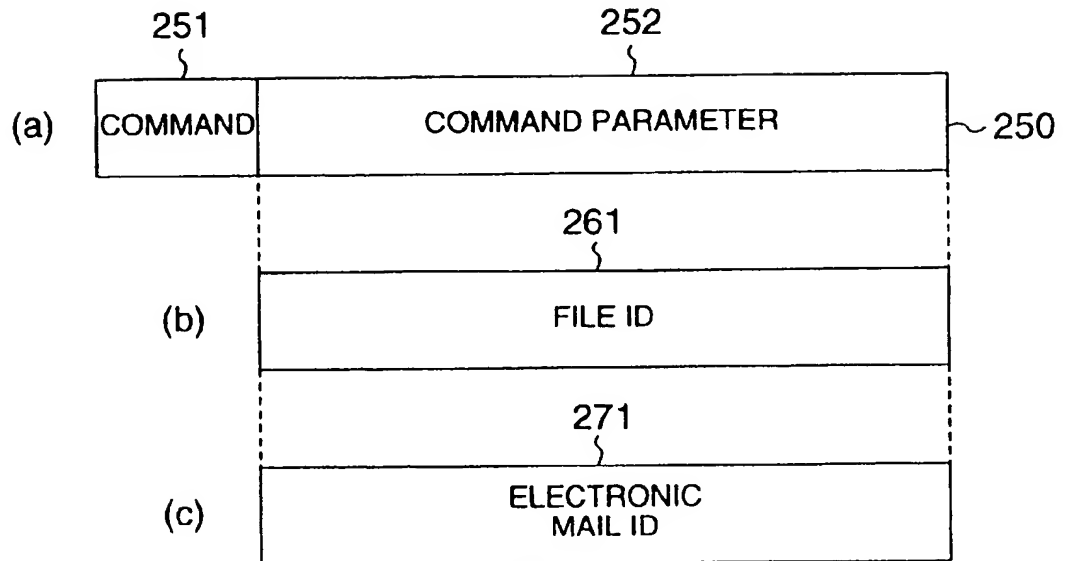


FIG. 6

301 USER ID	302 DESTINATION NUMBER	303 DIRECTORY	300

FIG. 7

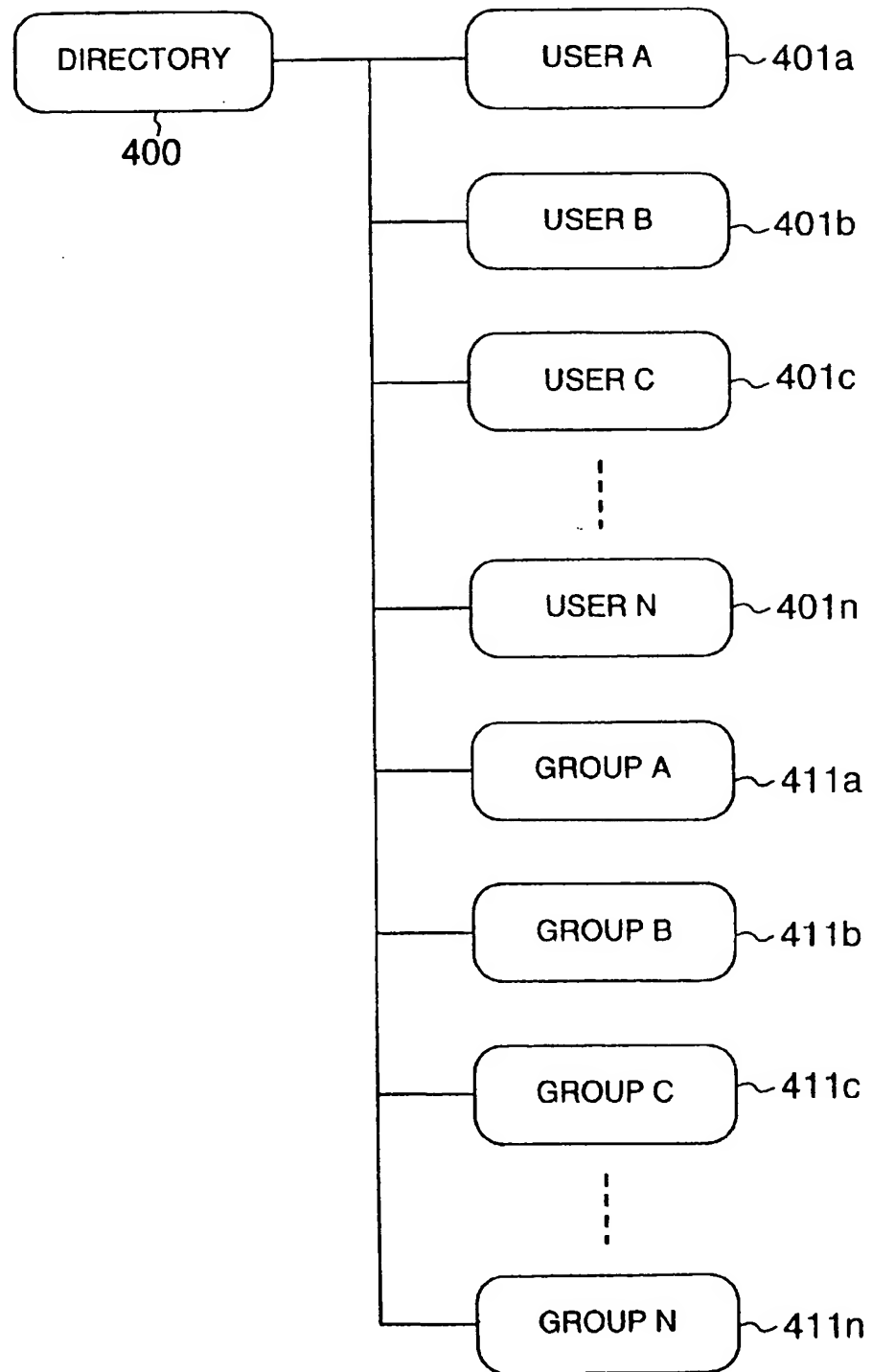


FIG. 8

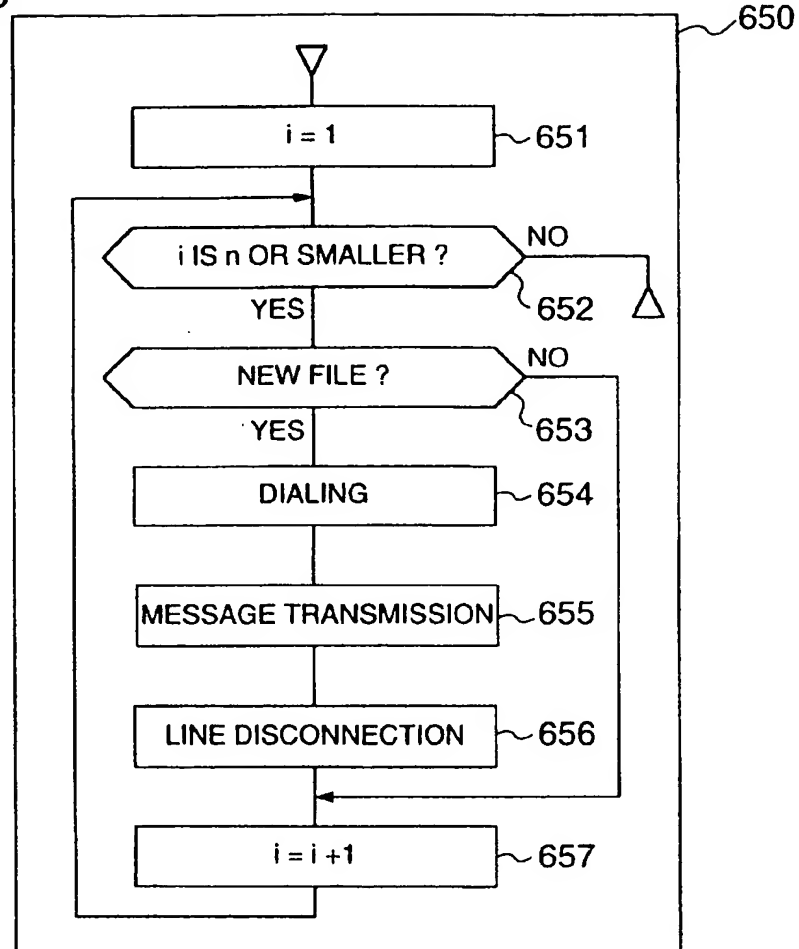


FIG. 9

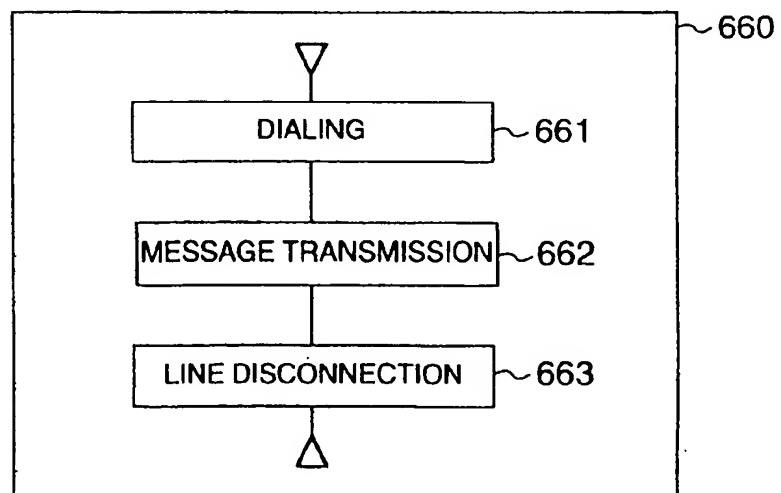


FIG. 10

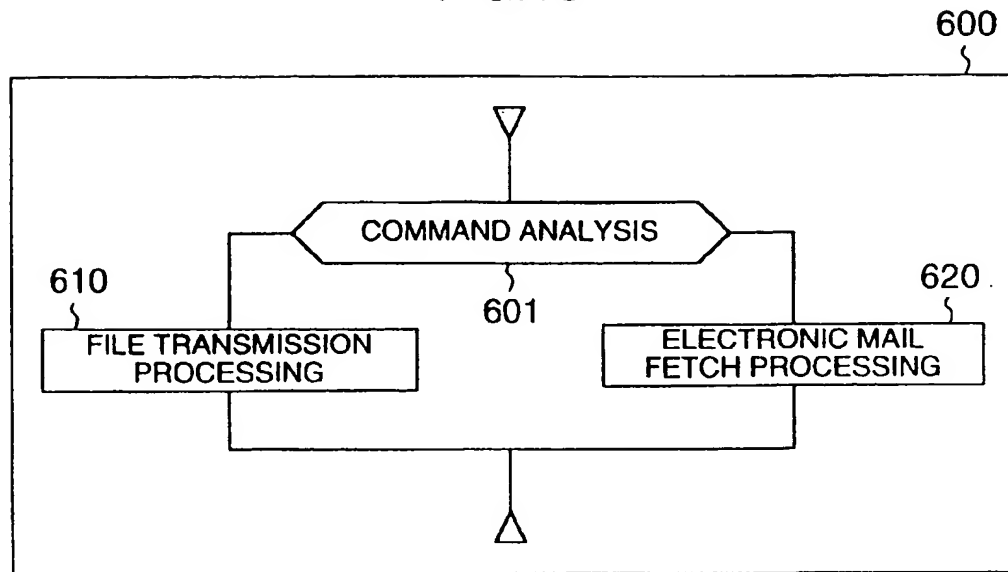


FIG. 11

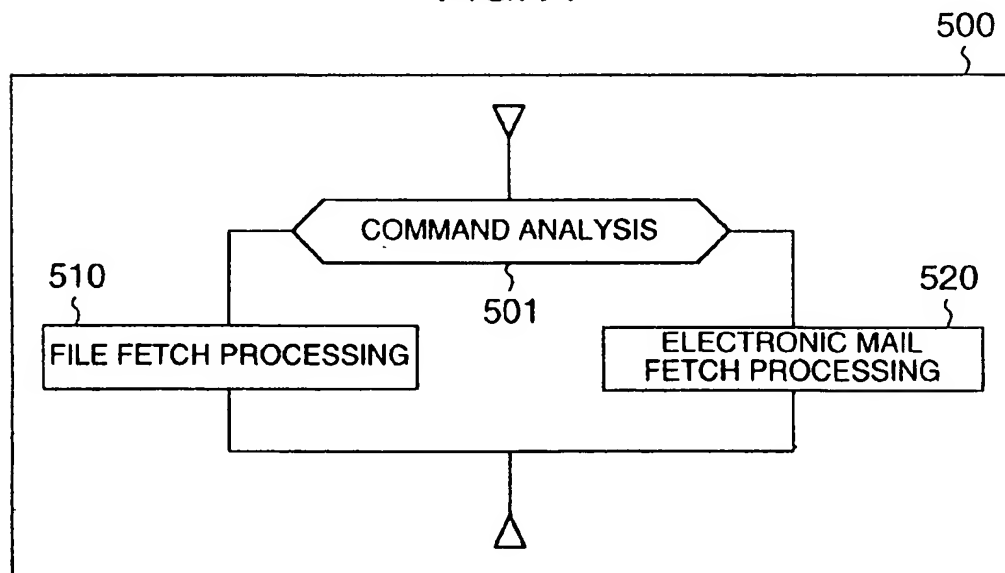


FIG.12

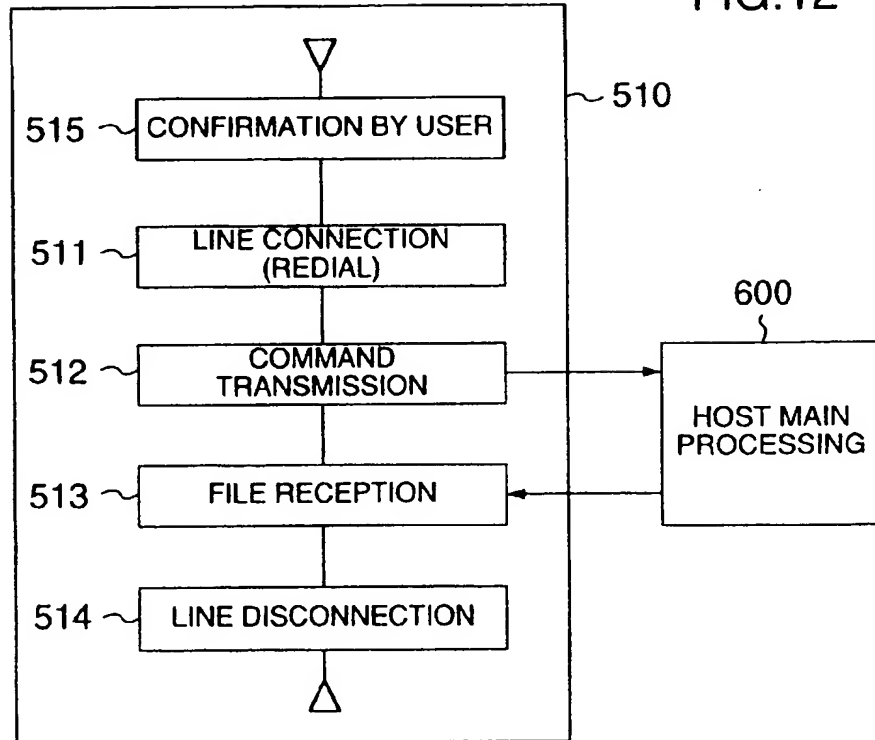


FIG.13

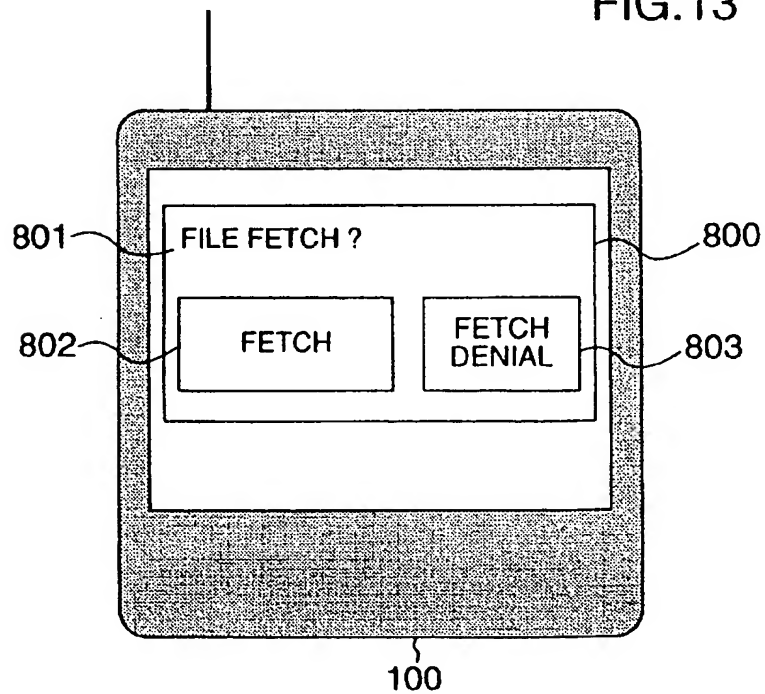


FIG. 14

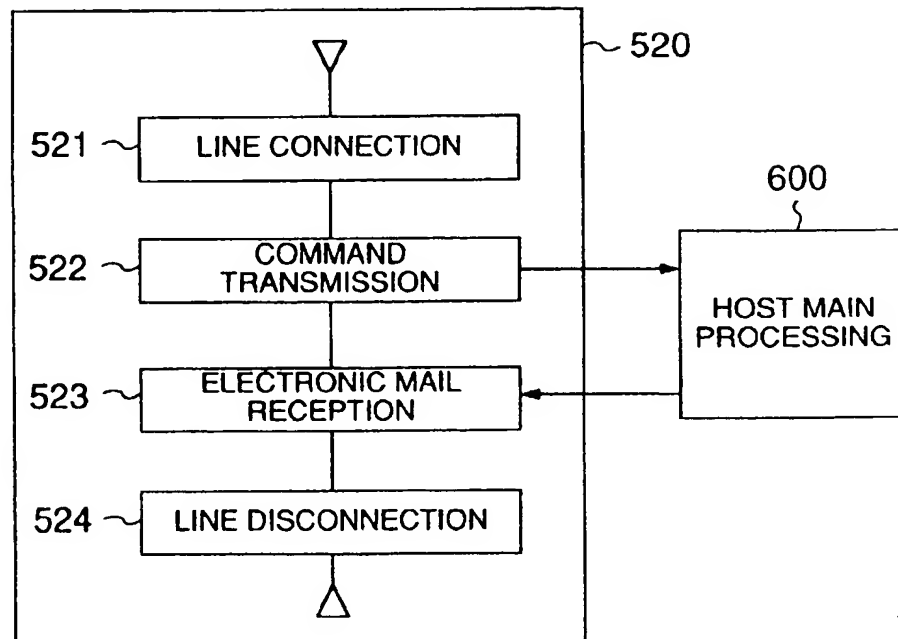


FIG. 15

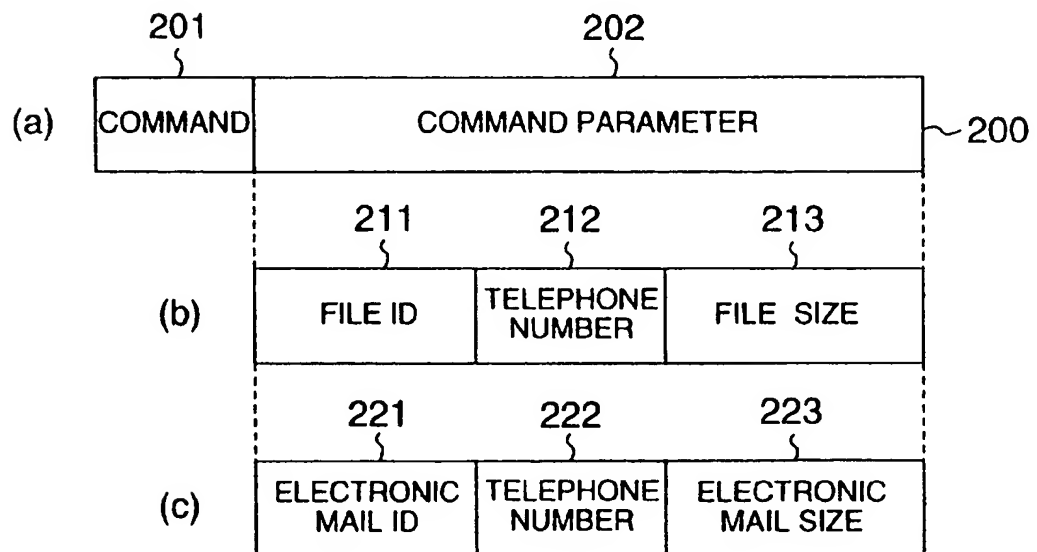


FIG.16

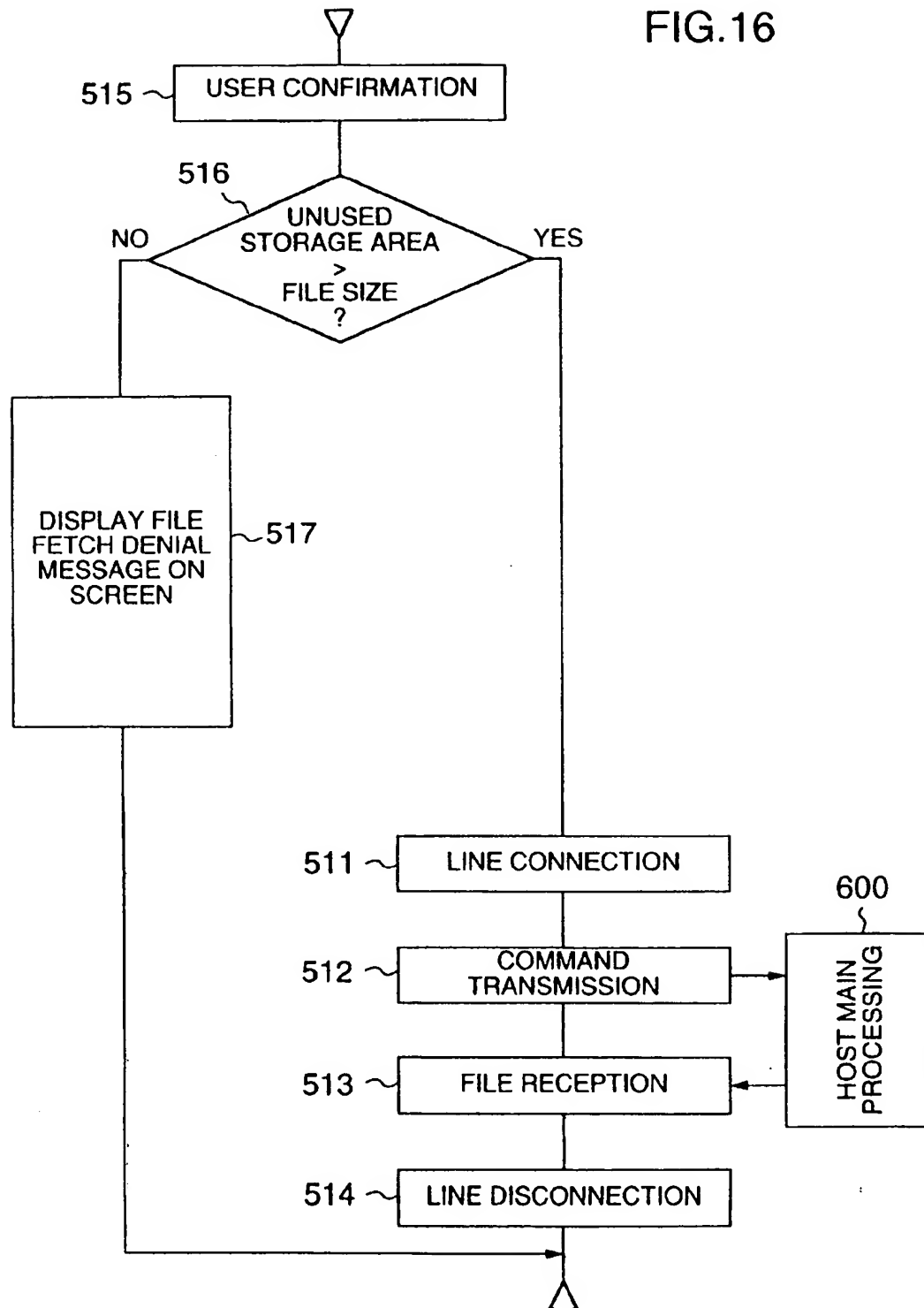


FIG. 17A

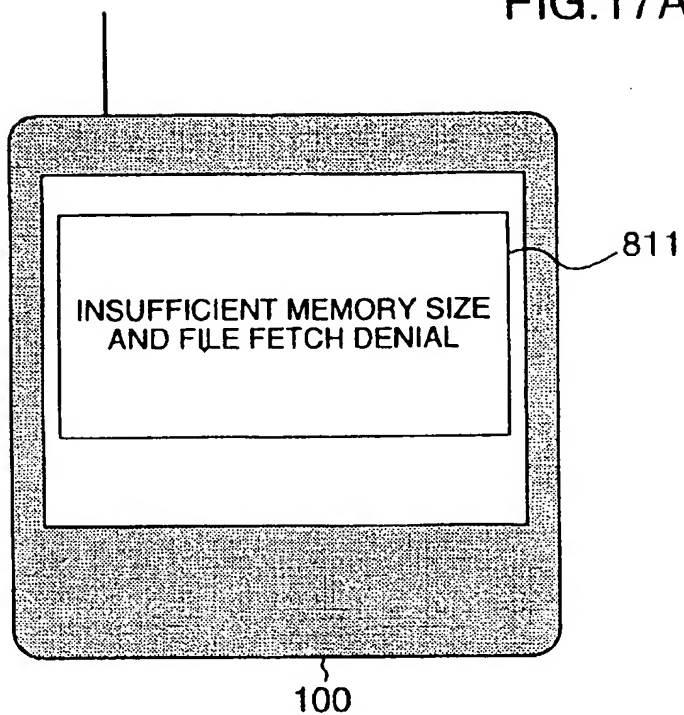


FIG. 17B

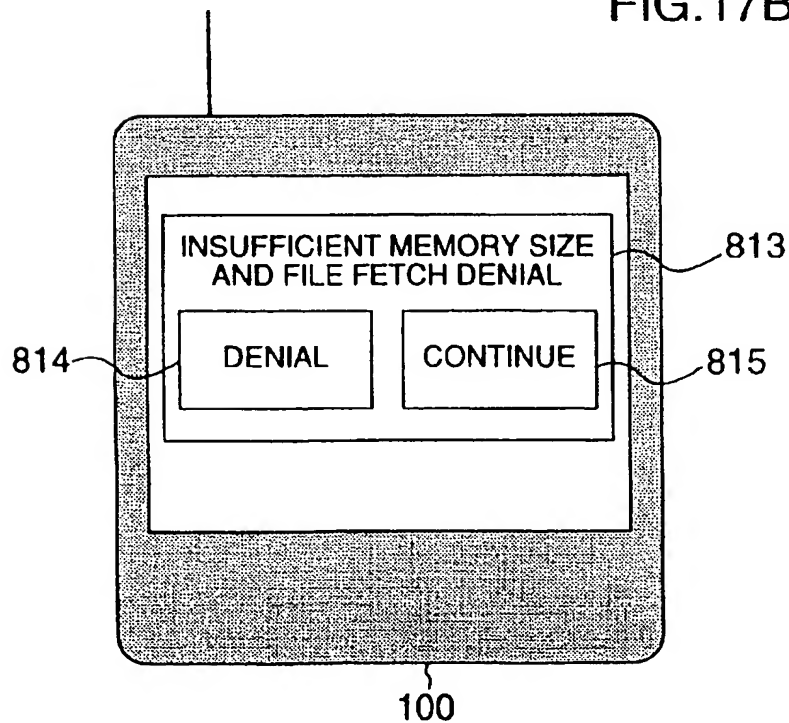


FIG. 18

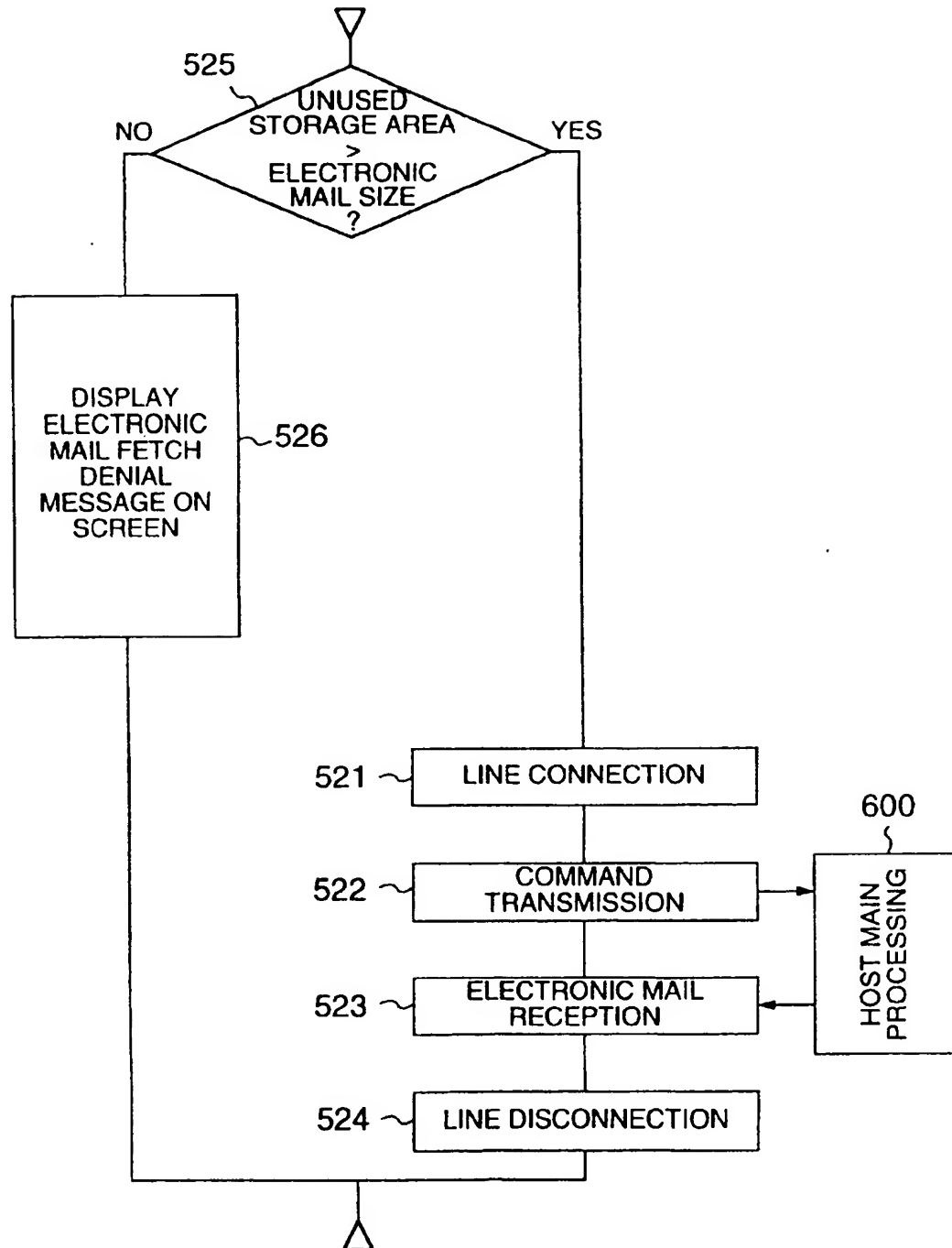


FIG. 19

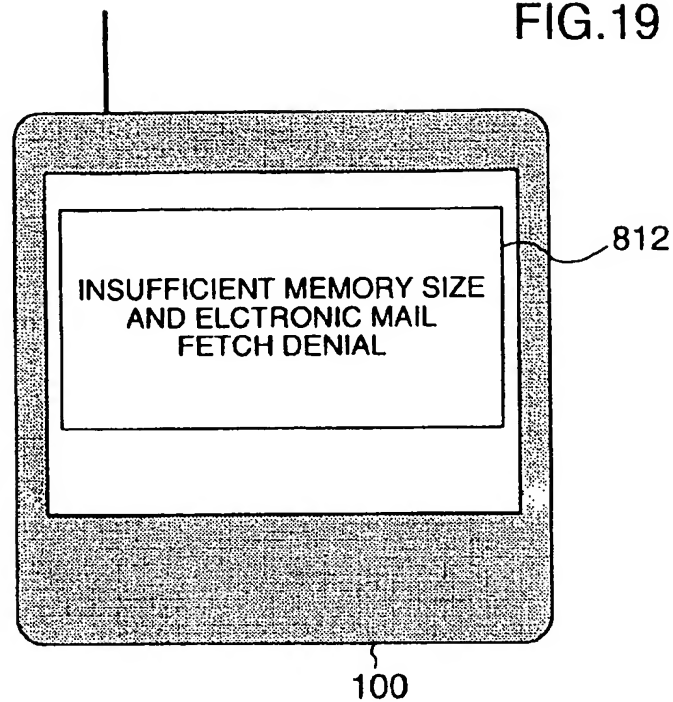


FIG. 20

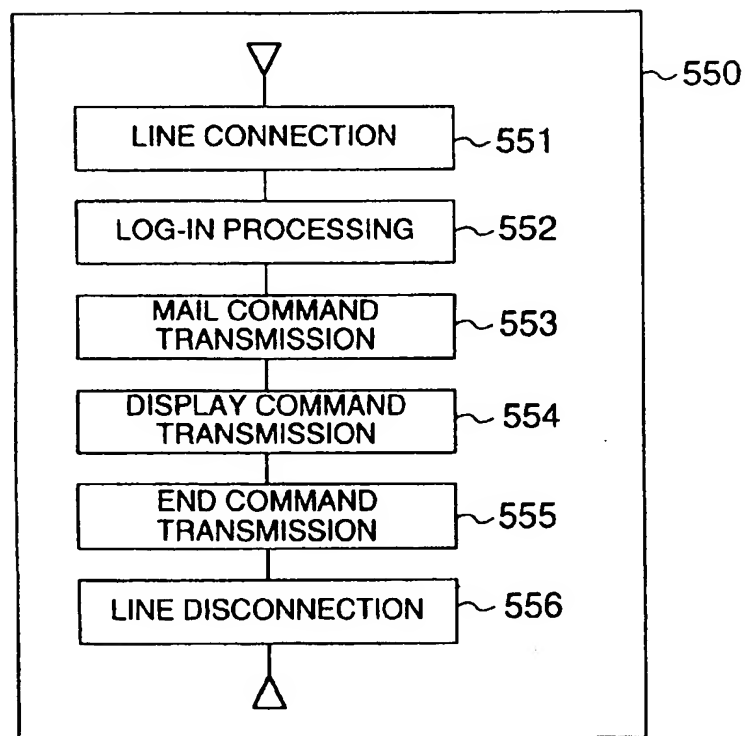


FIG. 21

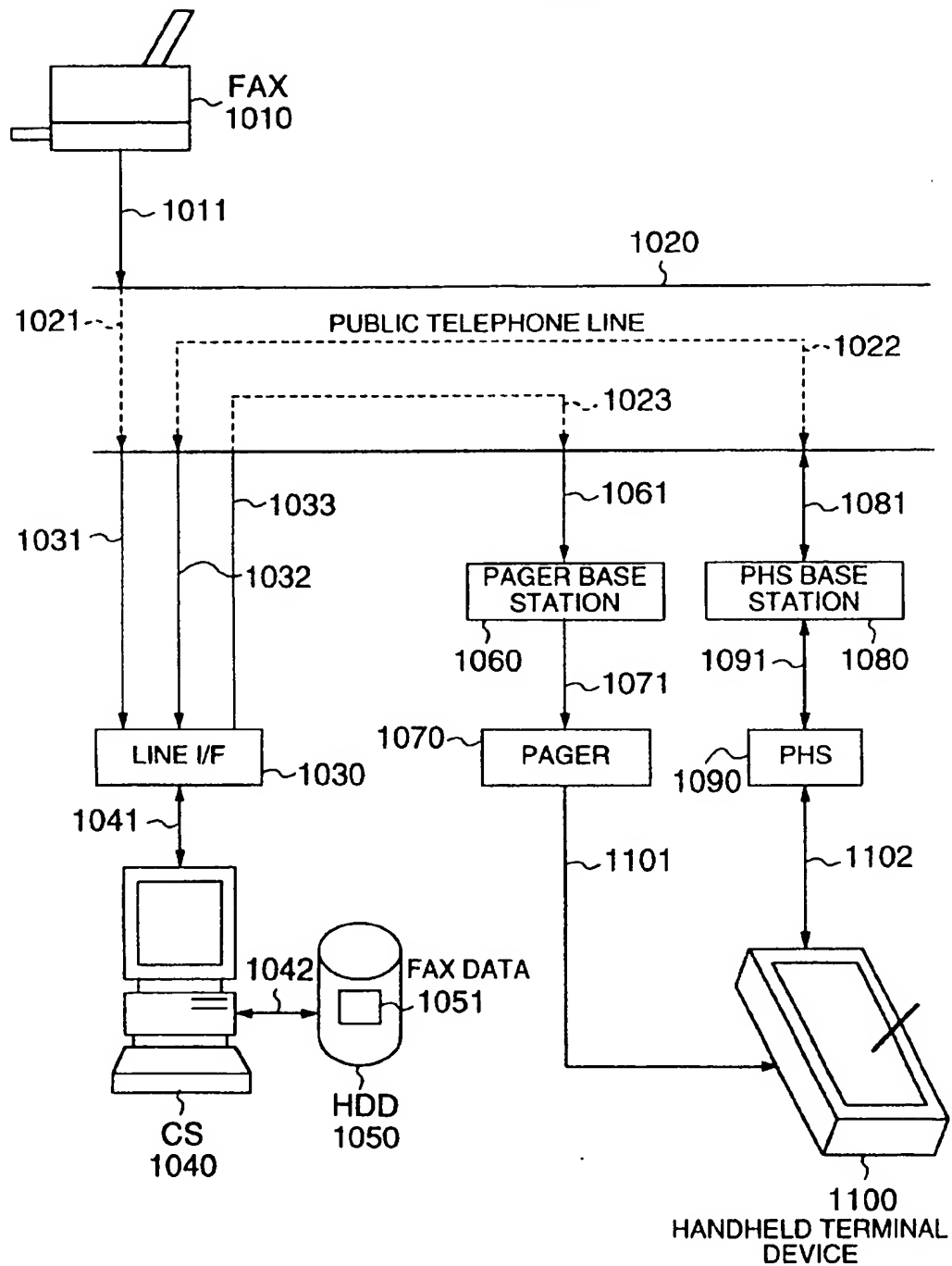


FIG.22A

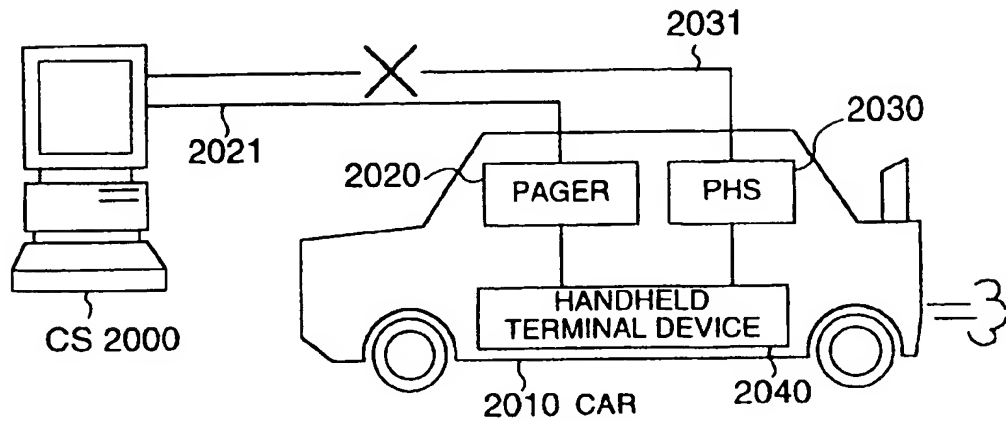


FIG.22B

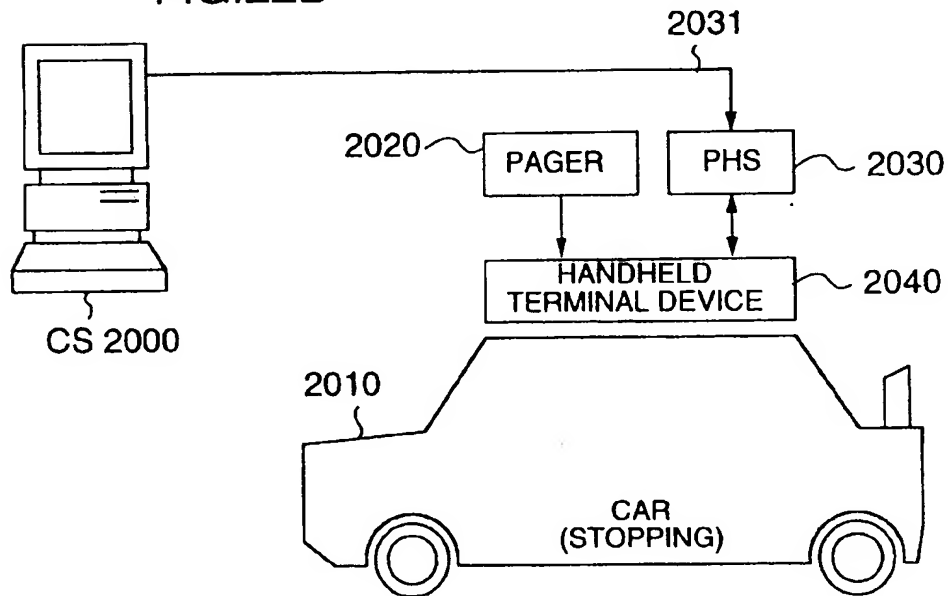


FIG.22C

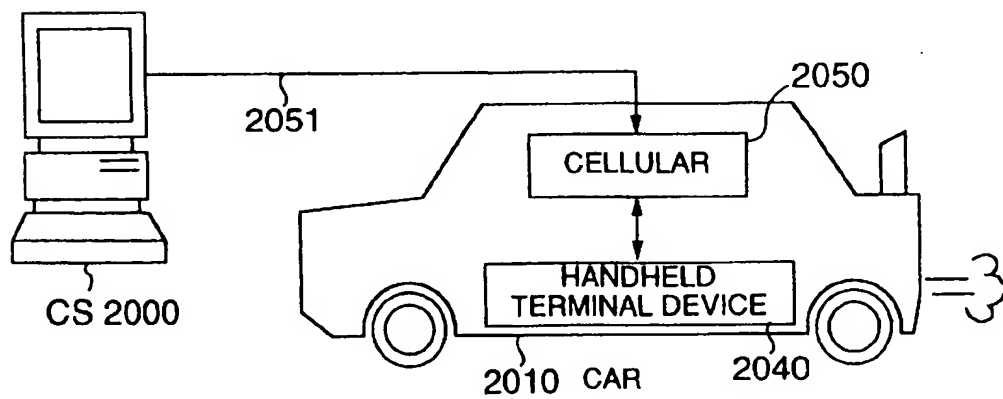


FIG. 23

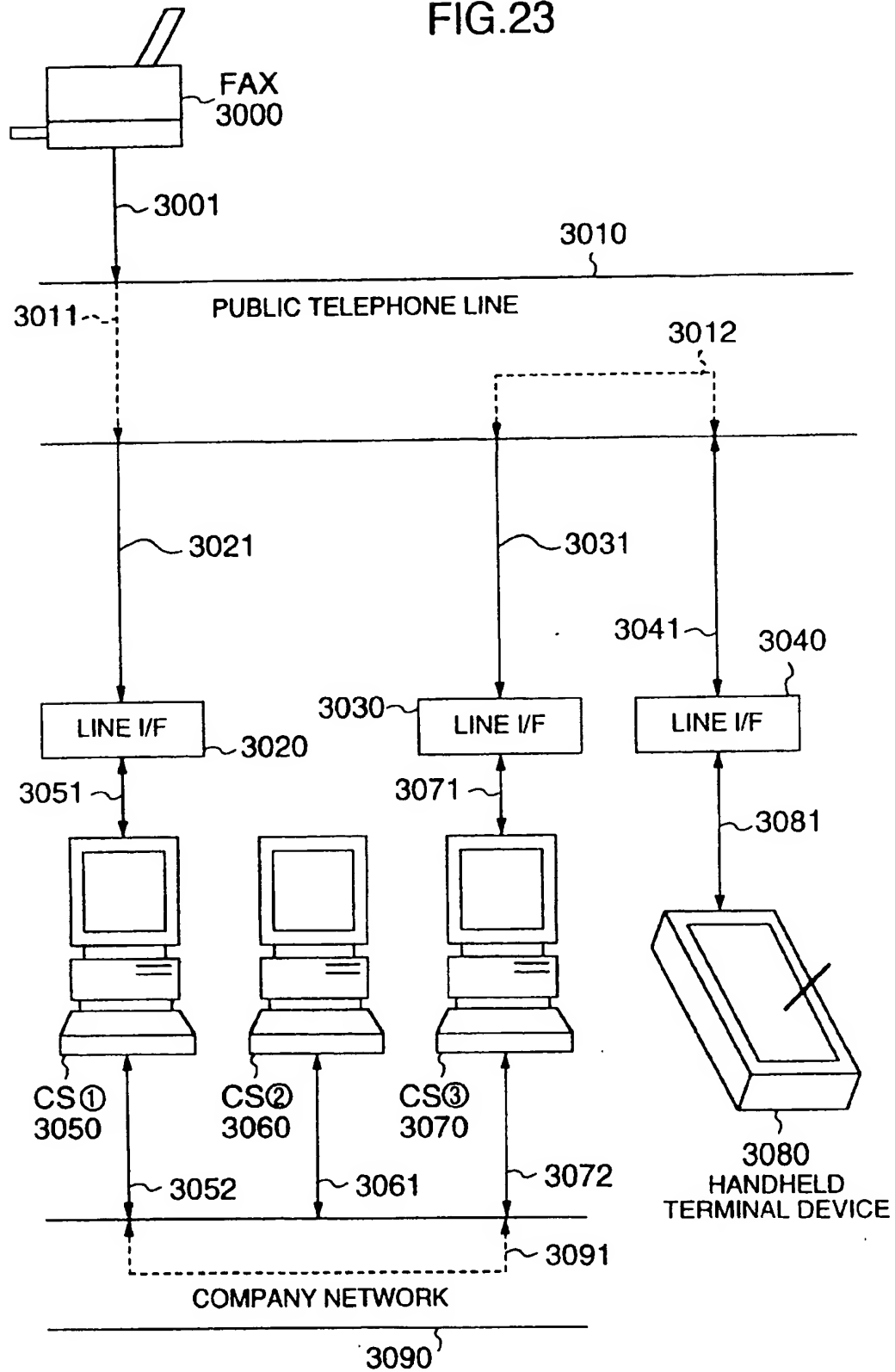


FIG. 24

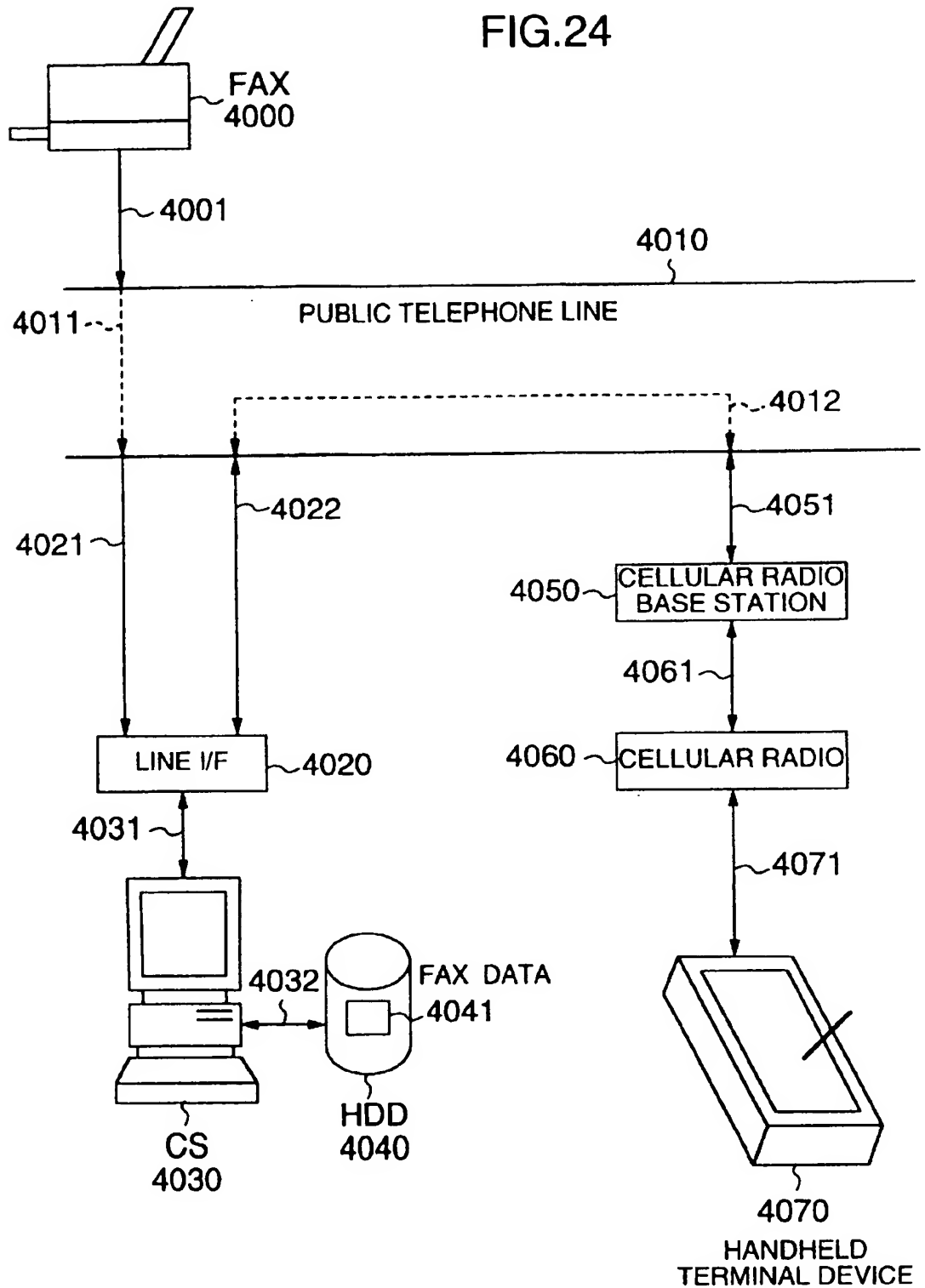


FIG.25

	TRANSMISSION STATION	DESTINATION STATION	MESSAGE CONTENTS	FORMAT	TRANSMISSION CONDITION
①	FAX	EXCHANGER	CS CALL TEL #	TONE/DIAL	EXCHANGER CARRIER
②	FAX	CS	HTD NUMBER	TONE	CS CARRIER
③	FAX	CS	FAX IMAGE	DIGITAL SIGNAL	CS CARRIER
④	CS	EXCHANGER	PAGER CALL #	TONE/DIAL	EXCHANGER CARRIER
⑤	CS	HTD	FAX ARRIVAL MESSAGE	DIGITAL SIGNAL	PAGER CARRIER
⑥	HTD	EXCHANGER	CS CALL TEL #	TONE/DIAL	EXCHANGER CARRIER
⑦	HTD	CS	FAX TRANS- MISSION REQUEST	DIGITAL SIGNAL	CS CARRIER
⑧	CS	HTD	FAX IMAGE	DIGITAL SIGNAL	HTD CARRIER

FIG.26

	TRANSMISSION STATION	DESTINATION STATION	MESSAGE CONTENTS	FORMAT	TRANSMISSION CONDITION
①	FAX	EXCHANGER	CS CALL TEL #	TONE/DIAL	EXCHANGER CARRIER
②	FAX	CS	HTD NUMBER	DIGITAL SIGNAL	CS CARRIER
③	FAX	CS	FAX IMAGE	DIGITAL SIGNAL	CS CARRIER
④	CS	EXCHANGER	PAGER CALL #	TONE/DIAL	EXCHANGER CARRIER
⑤	CS	HTD	FAX ARRIVAL MESSAGE	DIGITAL SIGNAL	PAGER CARRIER
⑥	HTD	EXCHANGER	CS CALL TEL #	TONE/DIAL	EXCHANGER CARRIER
⑦	HTD	CS	FAX TRANS- MISSION REQUEST	DIGITAL SIGNAL	CS CARRIER
⑧	CS	HTD	FAX IMAGE	DIGITAL SIGNAL	HTD CARRIER

FIG.27

	TRANSMISSION STATION	DESTINATION STATION	MESSAGE CONTENTS	FORMAT	TRANSMISSION CONDITION
①	FAX	EXCHANGER	CS CALL TEL #	TONE/DIAL	EXCHANGER CARRIER
②	FAX	CS	HTD NUMBER	DIGITAL SIGNAL	CS CARRIER
③	FAX	CS	FAX HEADER	DIGITAL SIGNAL	CS CARRIER
④	FAX	CS	FAX IMAGE	DIGITAL SIGNAL	CS CARRIER
⑤	CS	EXCHANGER	PAGER CALL #	TONE/DIAL	EXCHANGER CARRIER
⑥	CS	HTD	FAX ARRIVAL MESSAGE	DIGITAL SIGNAL	PAGER CARRIER
⑦	HTD	EXCHANGER	CS CALL TEL #	TONE/DIAL	EXCHANGER CARRIER
⑧	HTD	CS	FAX TRANS- MISSION REQUEST	DIGITAL SIGNAL	CS CARRIER
⑨	CS	HTD	FAX HEADER	DIGITAL SIGNAL	HTD CARRIER
⑩	CS	HTD	FAX IMAGE	DIGITAL SIGNAL	HTD CARRIER

SIGNAL CONTENTS TRANSMITTED BY FAX

FIG.28A

FAX HEADER (IMAGE.RUN-LENGTH FORMAT)
FAX IMAGE (IMAGE.RUN-LENGTH FORMAT)

SIGNAL CONTENTS TRASFERRED FROM CS TO PAGER OF
HANDHELD TERMINAL DEVICE

FIG.28B

FAX HEADER (CHARACTER CODE.RECEIVED IMAGE IS CONVERTED THROUGH CHARACTER RECOGNITION)
--

SIGNAL CONTENTS TRANSMITTED BY CS

FIG.28C

FAX HEADER (IMAGE.RUN-LENGTH FORMAT)
FAX IMAGE (IMAGE. RUN-LENGTH FORMAT)

FIG.29

	MESSAGE TRANSMITTED FROM CS TO PAGER OF HANDHELD TERMINAL DEVICE
①	FAX ARRIVAL MESSAGE (COMMAND)
②	FAX TRANSMISSION MESSAGE (NAME,TEL NO.,etc.)
③	RECEIVE DATE AND TIME
④	CALL TEL NUMBER OF RECEIVED CS
⑤	ID OF RECEIVED CS
⑥	MANAGEMENT NUMBER OF FAX IMAGES AT CS
⑦	LENGTH OF RECEIVED FAX IMAGE DATA
⑧	HEADER CHARACTER OF RECEIVED FAX IMAGE DATA (THROUGH CHARACTER RECOGNITION OF HEADER)

FIG.30

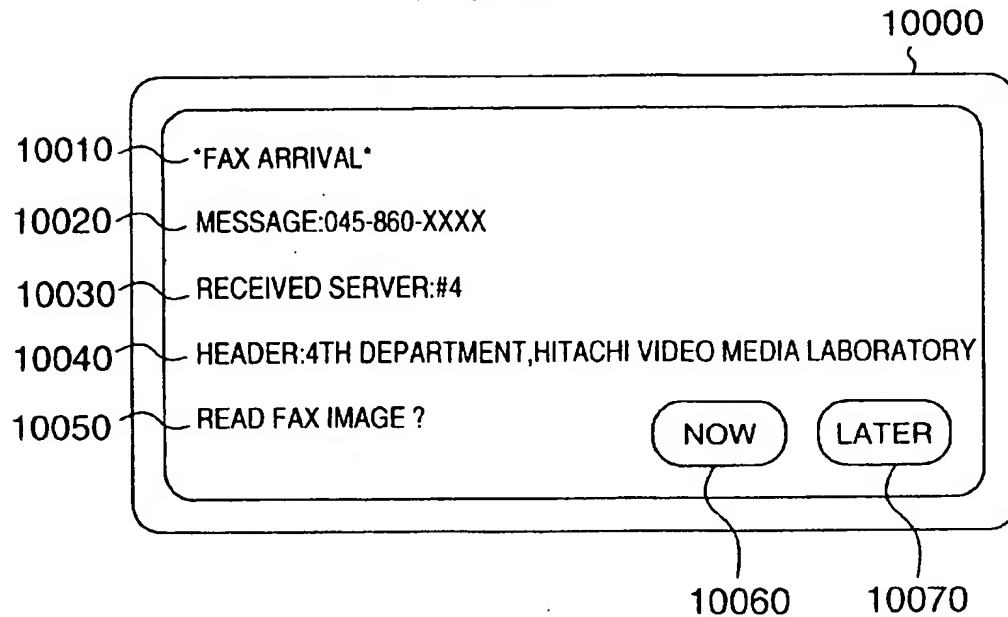


FIG.31

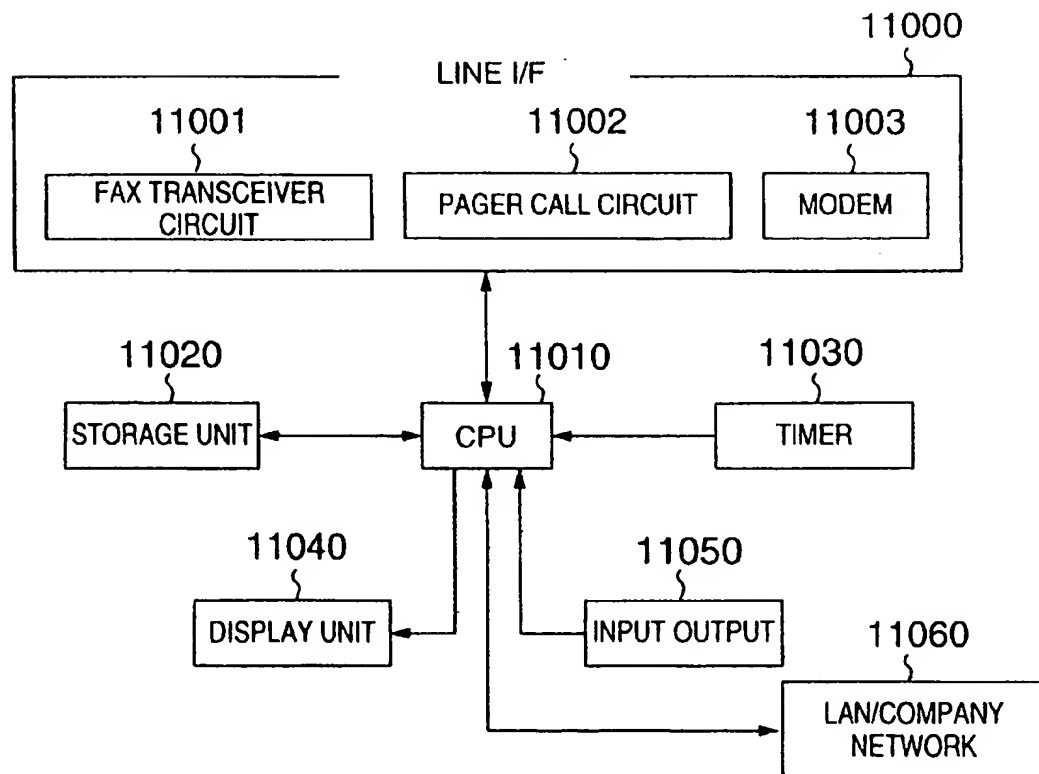


FIG.32

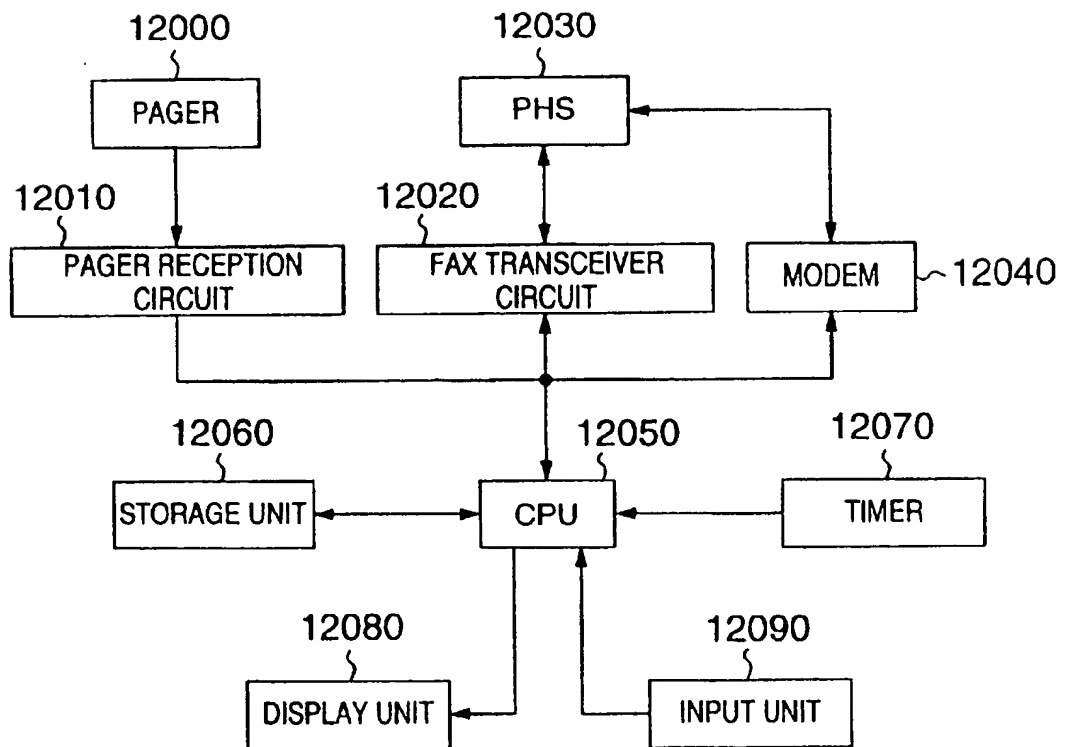


FIG.33

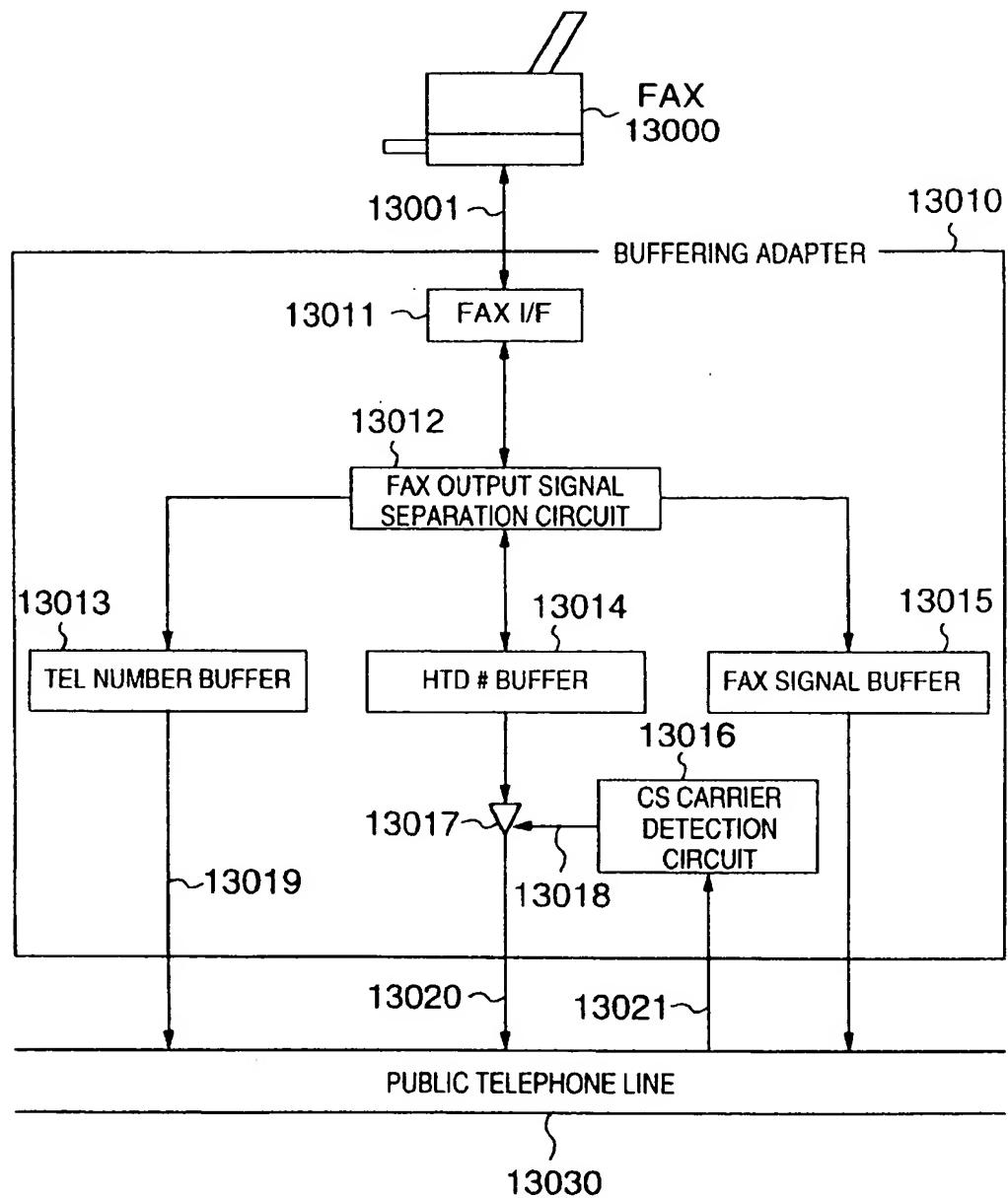


FIG.34

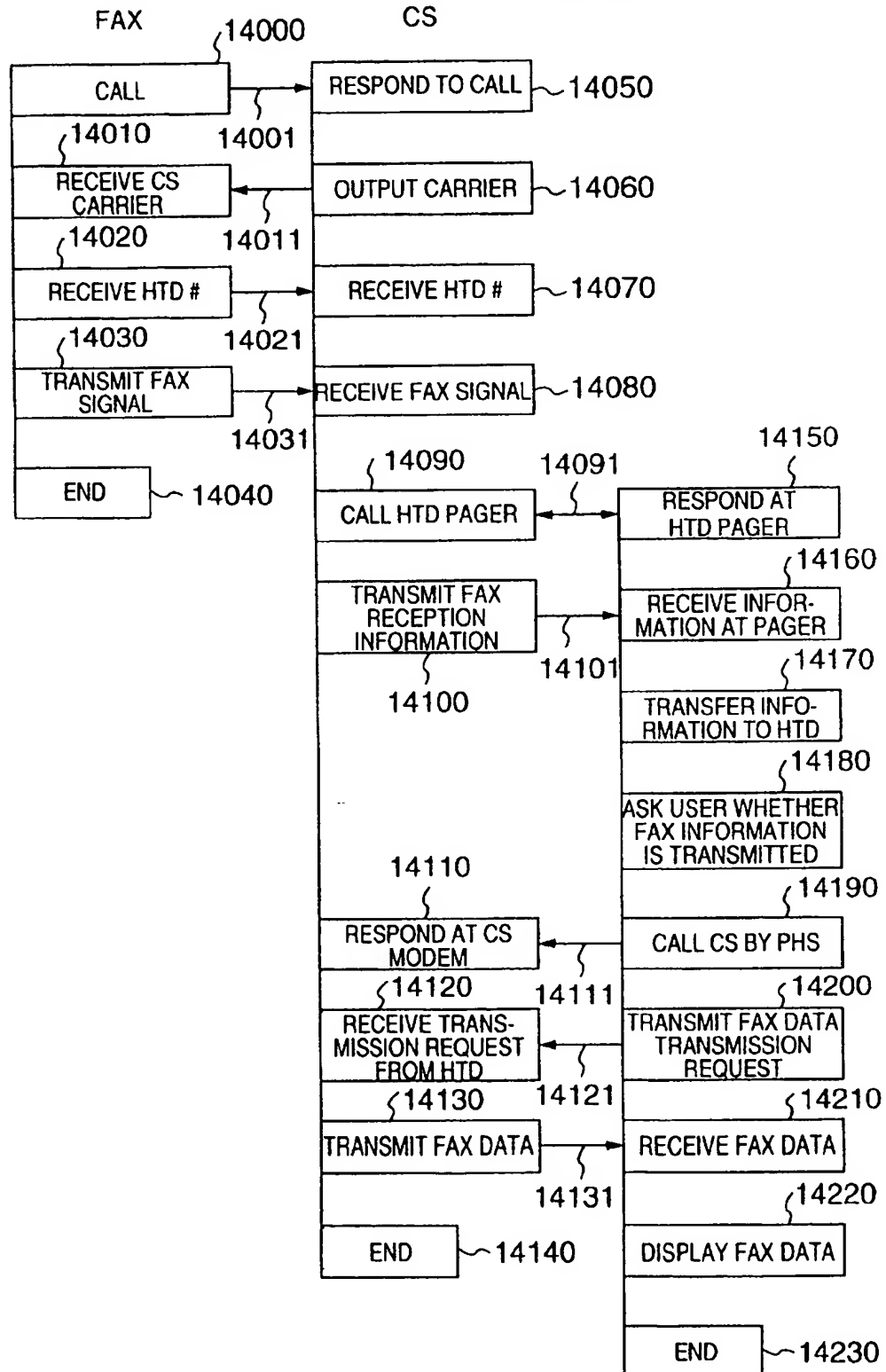


FIG.35

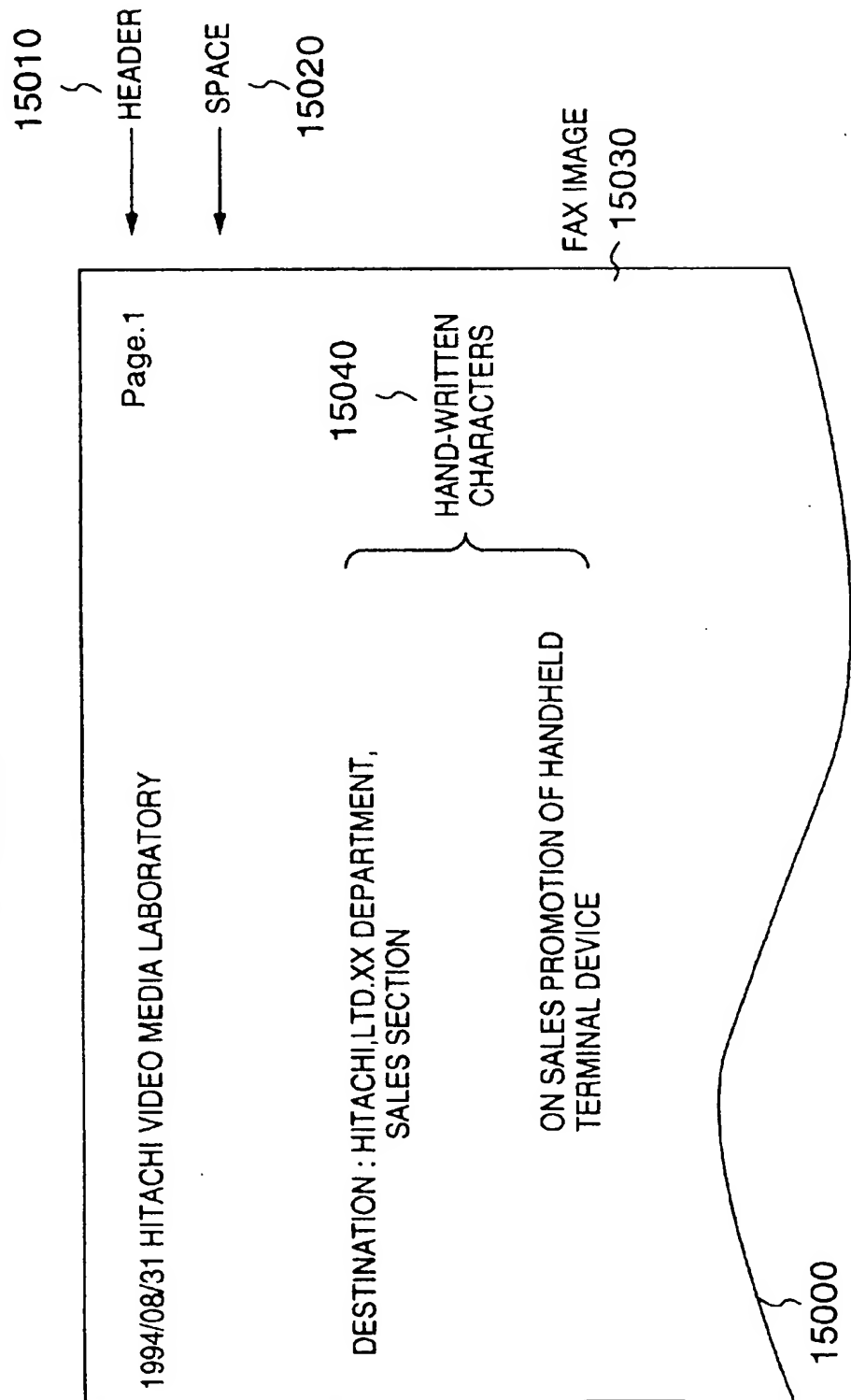


FIG.36

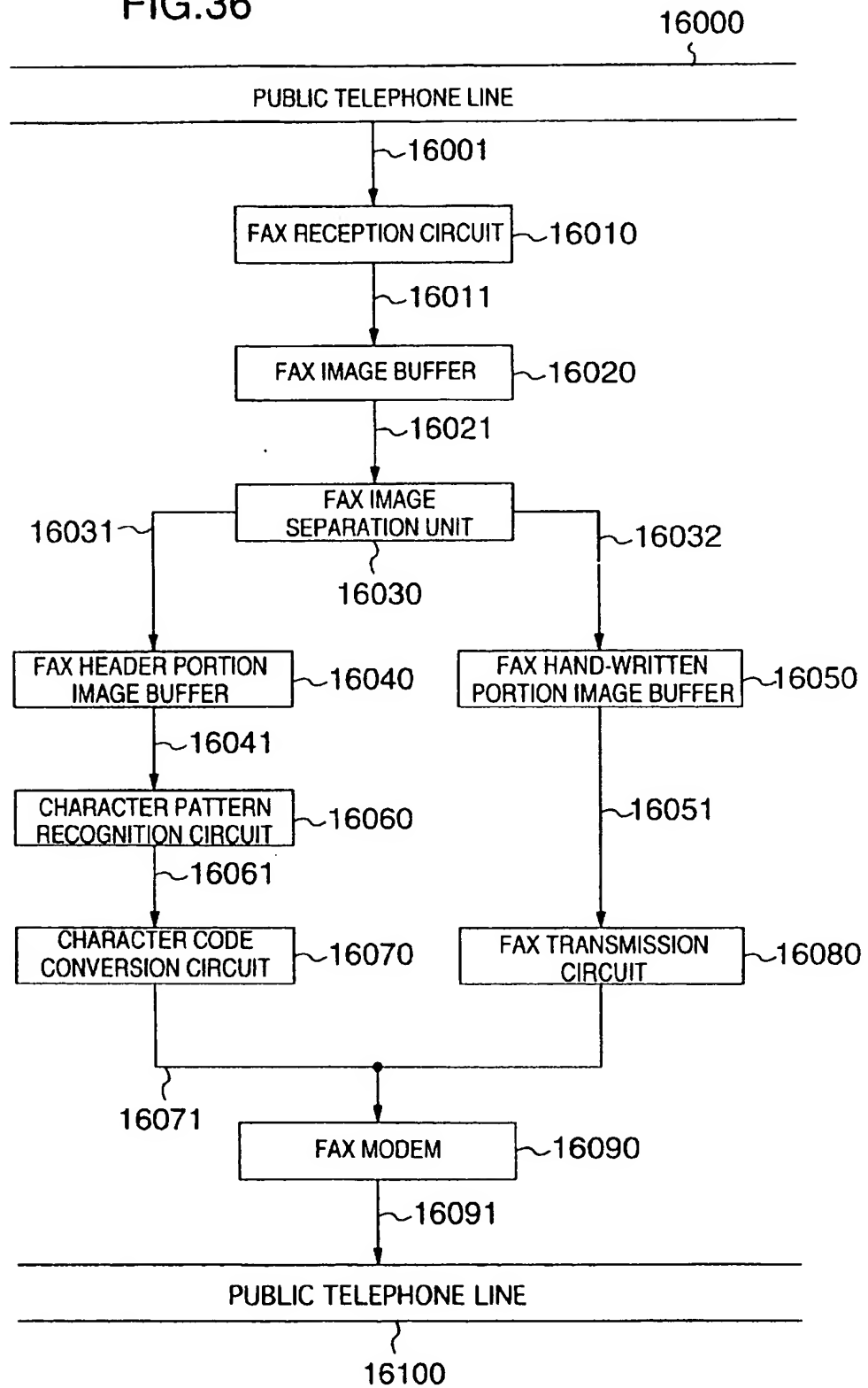


FIG.37

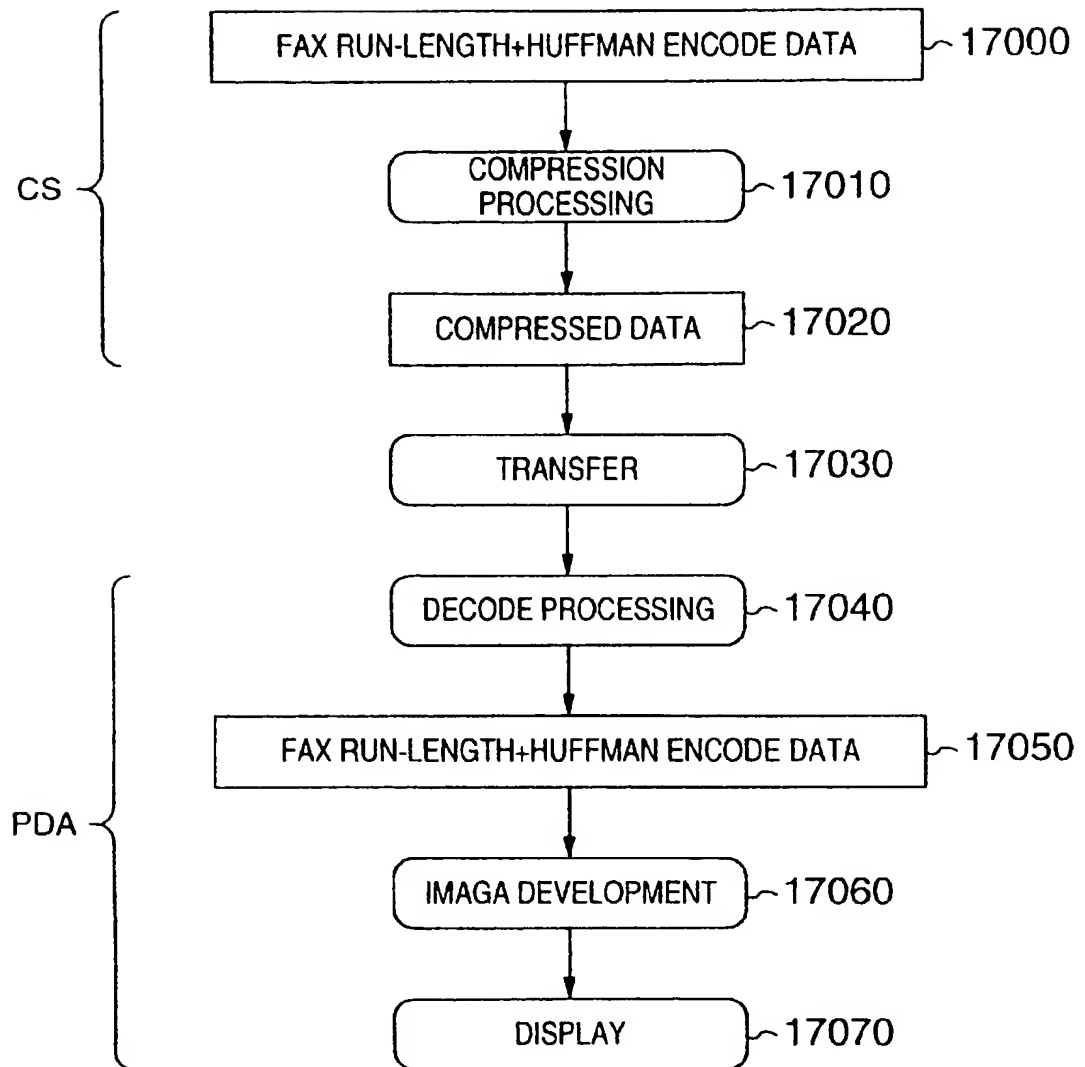


FIG. 38

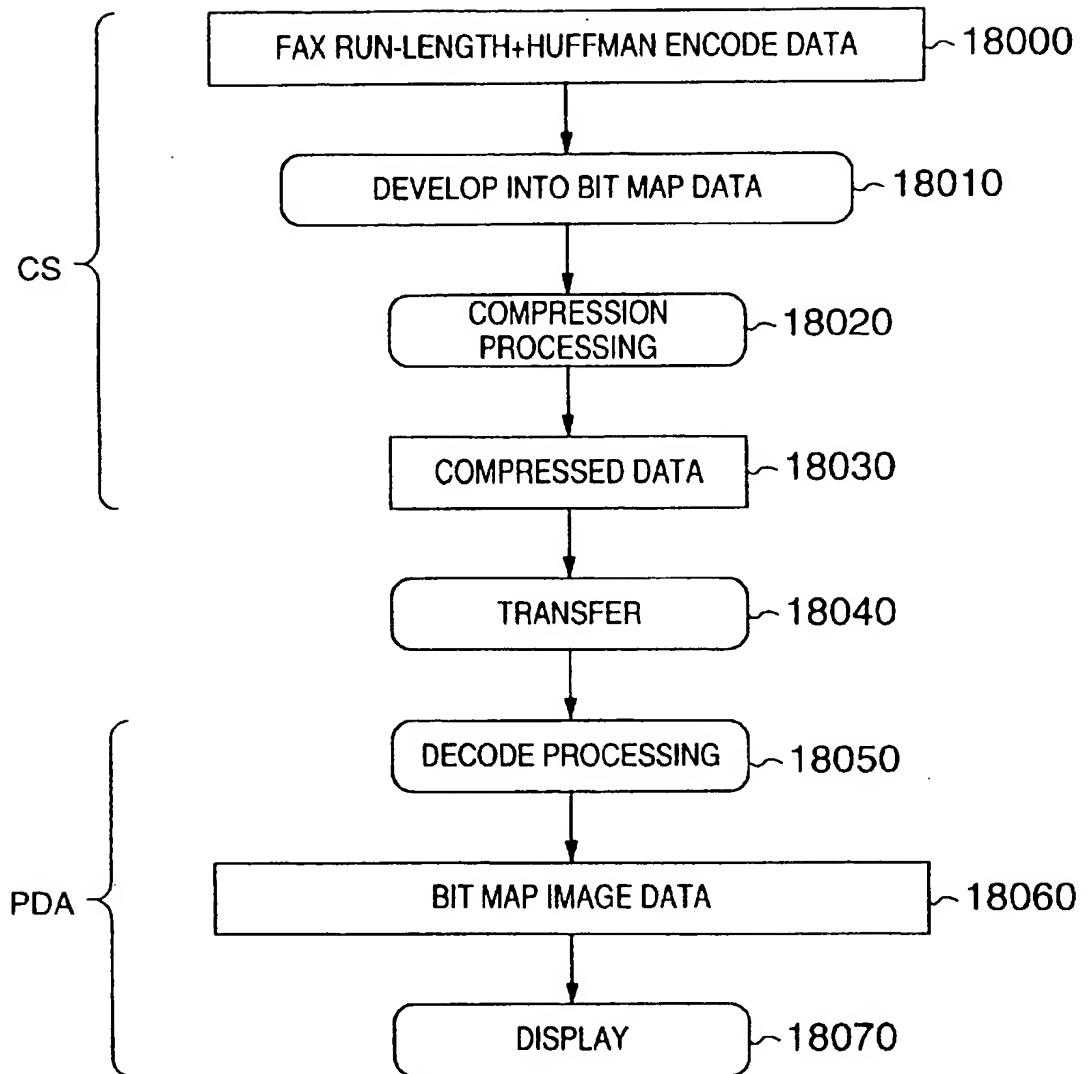
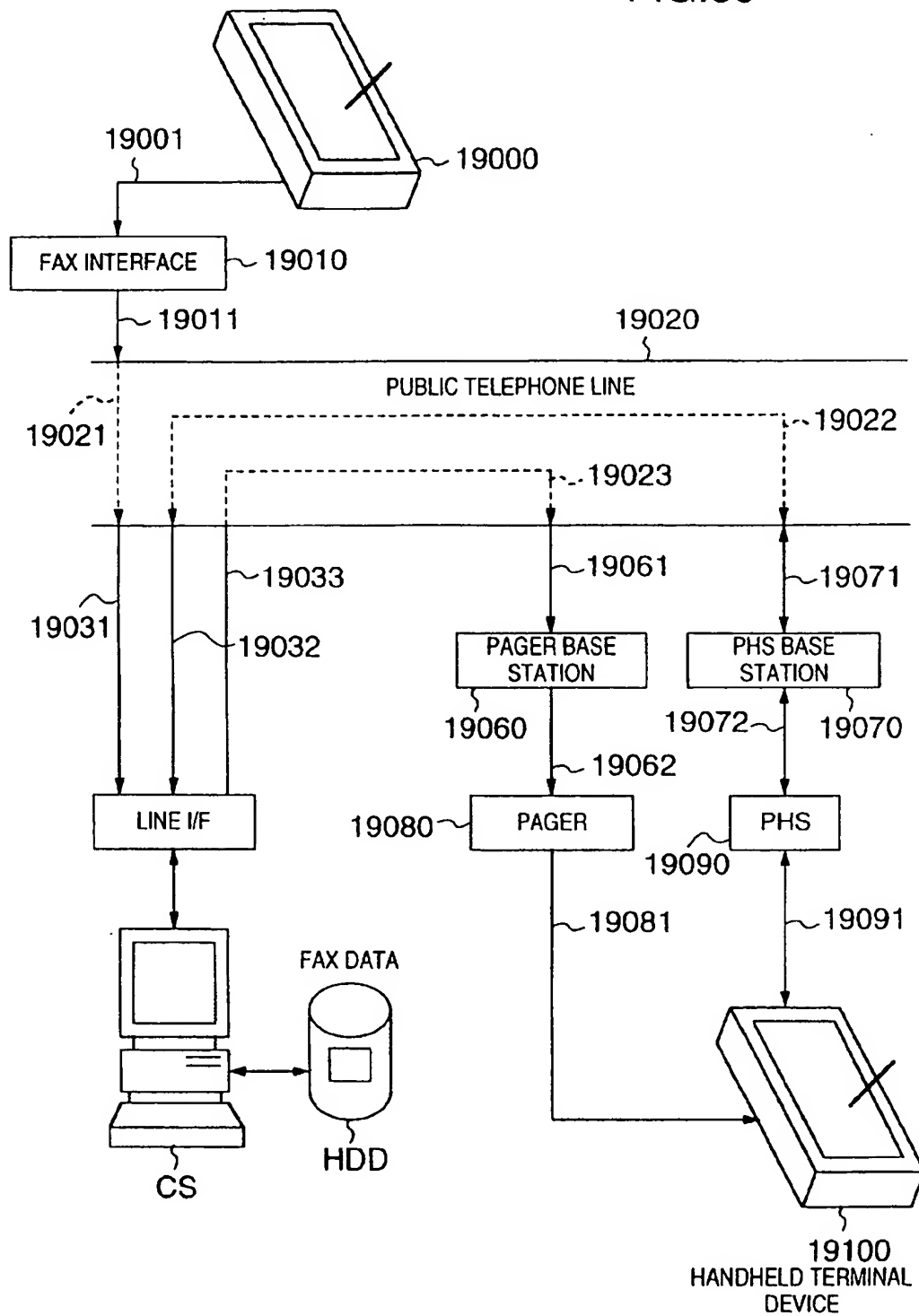


FIG.39



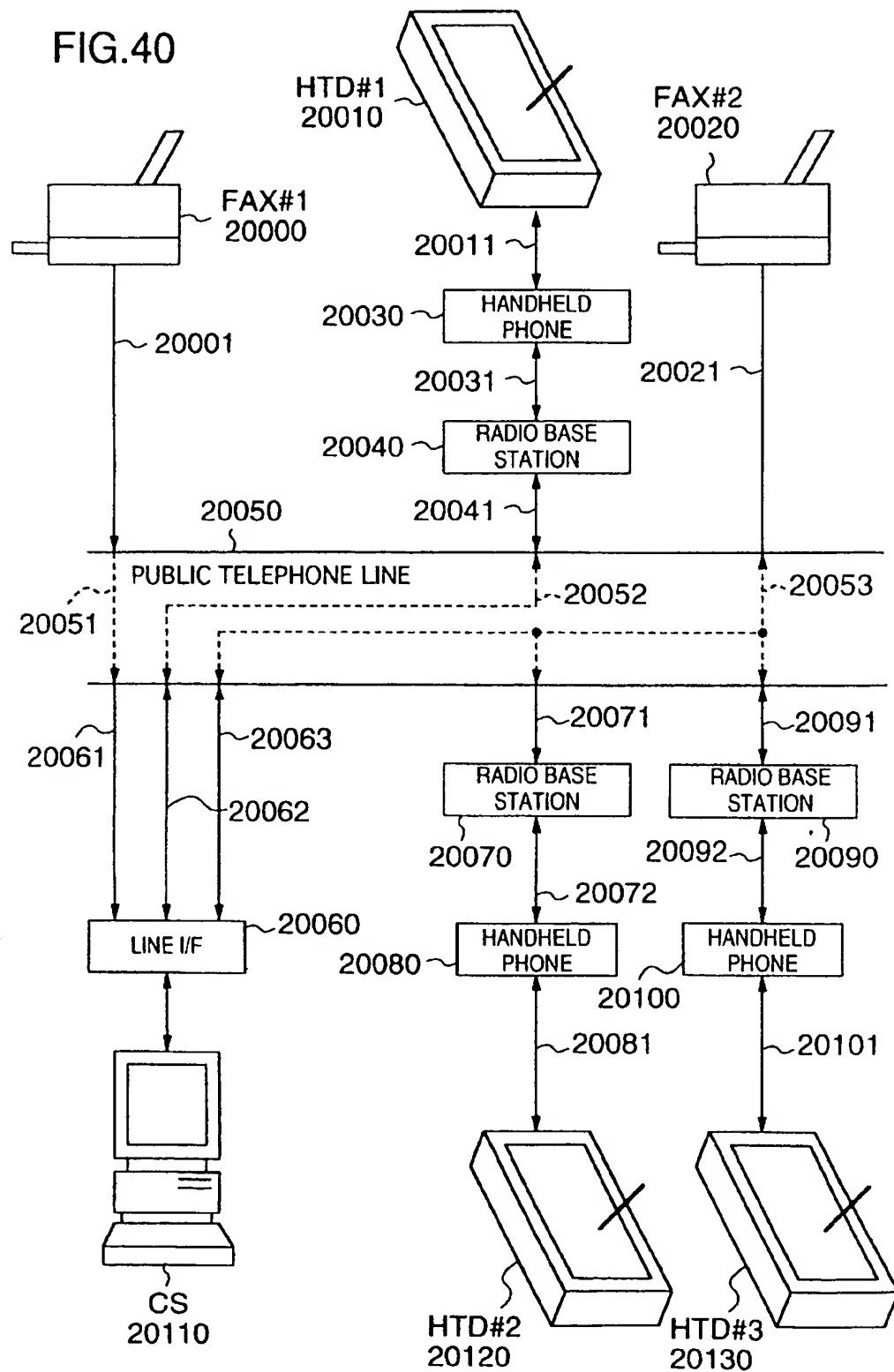


FIG.41A

21000

21010 *FAX ARRIVAL*

21020 MESSAGE:045-860-XXXX

21030 RECEIVED SERVER:#4

21040 HEADER:4TH DEPARTMENT,HITACHI VIDEO
MEDIA LABORATORY

21050 READ BRIEF FAX IMAGE ?

21060 21070

FIG.41B

21080 *FAX BRIEF HAS BEEN TRANSMITTED*

HEADER:4TH DEPARTMENT,HITACHI VIDEO MEDIA LABORATORY

1994/8/31 4TH DEPARTMENT,HITACHI VIDEO MEDIA
LABORATORY

DESTINATION:HITACHI,LTD.,XX DEPARTMENT,SALES
SECTION

21090 ON SALES PROMOTION OF PLEASE SEND THIS FAX
HANDHELD TERMINAL DEVICES ALSO TO MR.YOKOZAWA

DATE OF DELIVERY OF 100 DEVICES TO XX COMPANY WAS
CONFIRMED,SYSTEM CONFIGURATION IS AS FOLLOWS

HTD#1	HTD#2	HTD#3
SERVER#1	FAX#1	LAN · I/F

21110 ALL FAX IMAGE DATA 21100
TRANSMISSION ?

21120 FAX TRANSMISSION ? 21141

21130 FAX TELEPHONE NUMBER ?

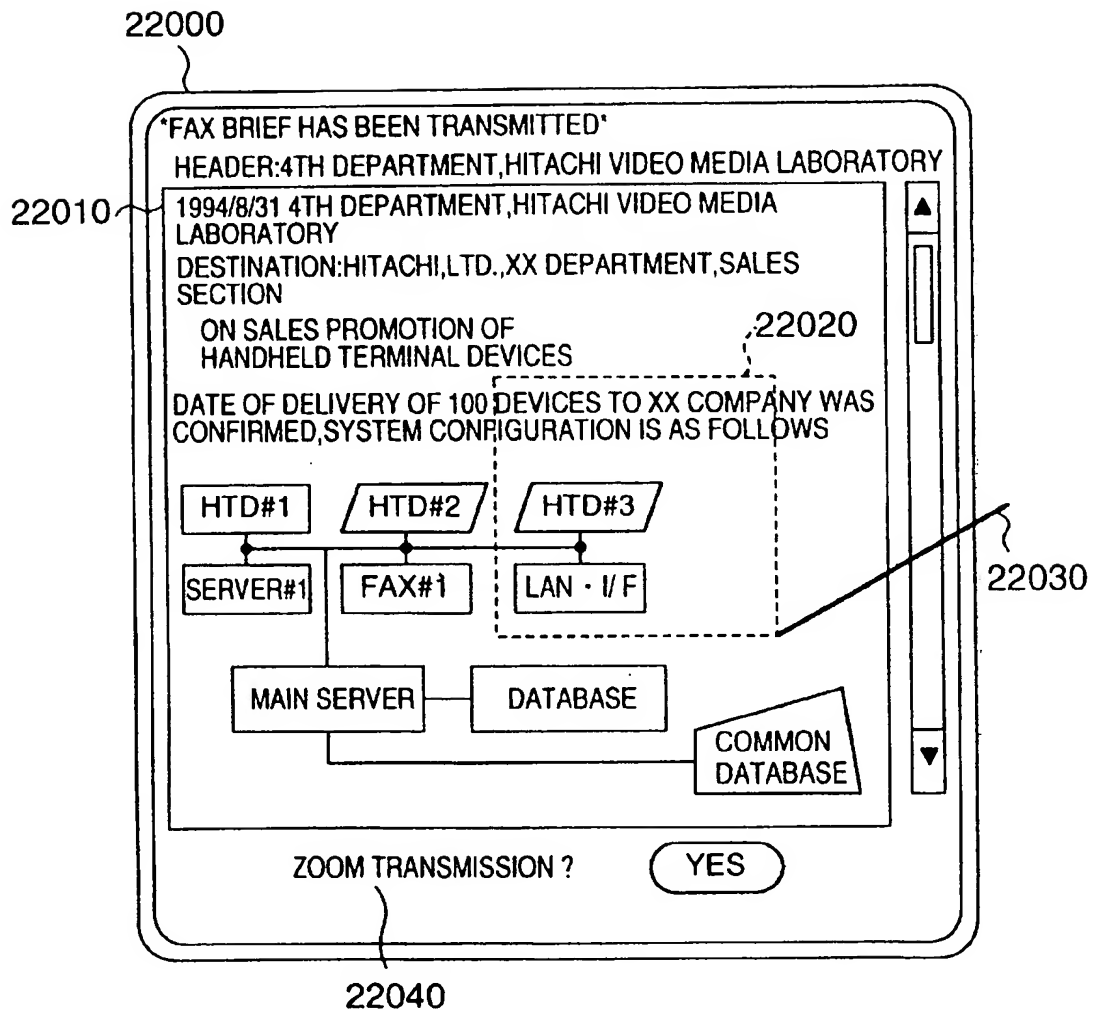
21140 TELEPHONE NUMBER LIST	HITACHI (VIDEO IMAGE LABORATORY) 045-XXX-XXXX
	HITACHI SALES MAIL DEPARTMENT 03-XXXX-XXXX

21150 TRANSMISSION TO ANOTHER
HANDHELD TERMINAL DEVICE ?

21160 RELATED HANDHELD TERMINAL DEVICE LIST	HIROSHI SHIMIZU (HITACHI SALES MAIN DEPARTMENT,FIRST SALES SECTION)
	TATUSHI YOKOZAWA (HITACHI(VIDEO IMAGE LABORATORY) FORTH SECTION)

21161 21162

FIG. 42



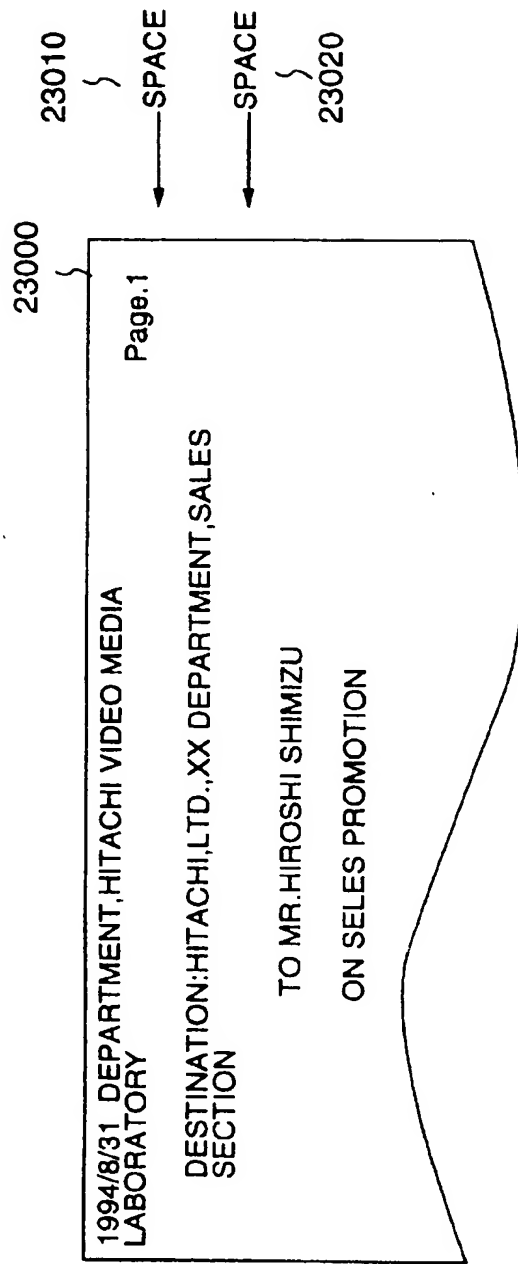


FIG. 43A

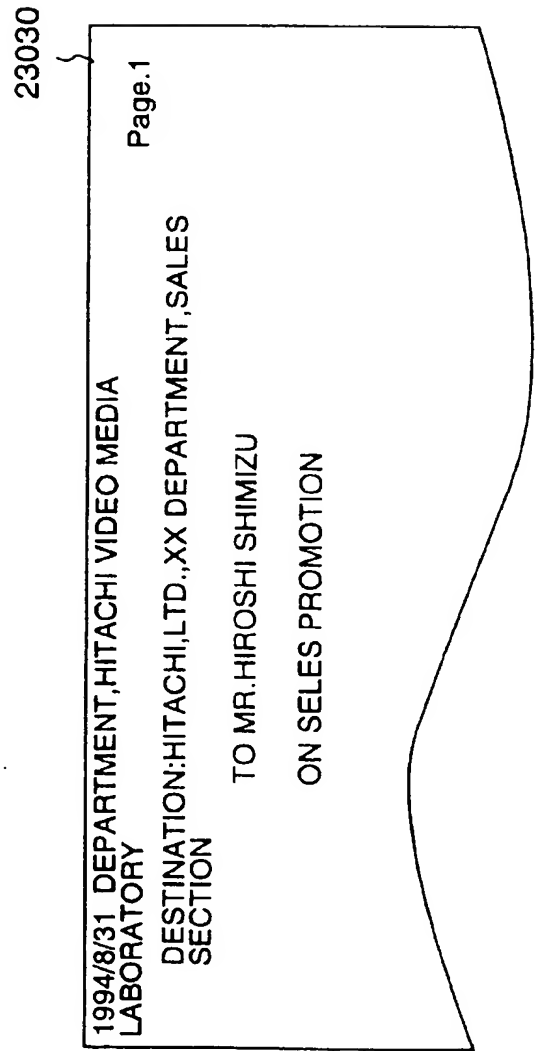


FIG. 43B

DATA TRANSFER SYSTEM AND HANDHELD TERMINAL DEVICE USED THEREFOR

BACKGROUND OF THE INVENTION

The present invention relates to a data transfer system, and more particularly to a data transfer system for quickly and reliably transferring necessary data to a handheld terminal device used at any location.

Recently message reception devices (pager) for radio call services are rapidly prevailing because these devices are relatively compact and low in cost. Exchange of electronic mails, data files, and the like via BBS (Bulletin Board System) is popular among personal computer communications, over Internet, and among other communications. Under such circumstances, services ("Electronic Mail Reception Notice Services" by NIFTY-Serve or NTT DoCoMo) are provided for promoting quick information exchange by automatically notifying the reception of electronic mail to a pager possessed by a user when mail to the user has been received at a BBS the user subscribes to.

The "Electronic Mail Reception Notice Services" notify the pager user only of the reception of electronic mail. Therefore, although the user can be notified of the reception of electronic mail, the contents of the mail cannot be known. Even if the user is informed earlier of the reception of electronic mail from the page the contents of the electronic mail cannot be known until the user connects to the host station of BBS and reads the contents of the electronic mail by using a personal computer at an office or home. Therefore, depending upon the circumstances when a user is informed of the reception of electronic mail, quick information exchange is not necessarily ensured.

Apart from pagers, facsimiles (hereinafter abbreviated as "FAX") are known as an apparatus for quickly and reliably transferring information, in the form of image data such as characters and graphics drawn on a sheet of paper, to remote sites by using public lines such as telephone lines. Generally, FAX is used for transferring image data to a fixed site. If a callee is out of his/her office and at a different location, FAX installed nearest to the callee is checked in accordance with the schedule of the callee, and the image data is sent to that FAX. In this case, if the callee moves to a place different from the initial schedule, the image data cannot be sent directly to the callee.

In order to deal with such circumstances, two types of FAXes "Bishamon [HF-TM1]" and "Bishamon [HFTB1]" manufactured and sold by the present assignee are provided with a memory reception function and a transfer function. When the two types of FAXes receive image data from another FAX, they store it in an internal memory instead of printing it out on a paper sheet, and thereafter notify the callee of the reception of the image data by calling "pager" always carried by a callee of the FAXes. When the callee is informed of the reception of the image data by the pager, the callee uses another FAX installed nearby to connect to his/her own FAX, to remote-control it through the tone dial, and to have the image data stored in the internal memory sent to the callee via the nearby FAX. In this manner, the contents of the received image data can be known quickly, and the caller who sent information over a FAX does not necessarily have to pay attention to the schedule and present location of the callee.

However, even with these two types of FAXes, the contents of image data cannot be known quickly unless there is a FAX near the callee who is informed of the reception of the image data by a pager. Furthermore, since the contents

notified by the pager regard only the reception of image data, it is impossible to judge beforehand whether the contents of the image data should be read at once because they are important. Assuming that a callee is waiting for information regarding a very important issue and there is a call from the pager, the callee intercepts its work and finds a nearby FAX to perform an image data transfer operation described above, even if the contents of the image data are information regarding an issue not so important.

Low power consumption of a handheld or portable phone in combination with a pager is disclosed in JP-A-6-6302 and JP-A-6-97877.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a data transfer system and a handheld terminal device wherein when a callee is informed of the reception of data from its handheld terminal device, the callee can immediately check the contents of the received data on site.

The above object is achieved by arrival data acquisition means (e.g., an arrival data acquisition processing 500 in FIG. 11) of a preferred handheld terminal device with the communication function of this invention. This means receives a new arrival message indicating the reception of new data and automatically controls an acquisition processing of the data in accordance with the contents of the new arrival message.

The new arrival message may contain data identifier information for identifying the data (e.g., a file ID 211 shown in FIG. 4). In this case, the arrival data acquisition controlling means includes a new arrival message analysis processing unit for analyzing the received new arrival message and deriving the data identifier information (e.g., a command analysis at Step 501 of an arrival data acquisition processing 500) and a received data transmission controlling unit for controlling a transmission process of the data in accordance with the data identifier information (e.g., a file fetch processing at Step 510 of the received data acquisition processing 500).

The arrival message may contain data identifier information for identifying the data and connection information for accessing the data (e.g., a telephone number 212 shown in FIG. 4). In this case, the received data acquisition controlling means includes a new arrival message analysis processing unit for analyzing the received new arrival message and deriving the data identifier information and the connection information, a connection establishment processing unit for performing connection processing of a communication line in accordance with the connection information (e.g., a line connection 511 shown in FIG. 12), and a received data transmission controlling unit for controlling transmission processing of the data in accordance with the data identifier information.

The handheld terminal device may be provided with a retry control unit for controlling the connection establishment processing unit to repetitively perform communication line connection processing, until a predetermined number of retries are carried out or a communication line is established.

The handheld terminal device may be provided with a user confirmation processing unit for allowing the user to determine whether an acquisition processing for the data is to be performed or not (e.g., user confirmation 515 shown in FIGS. 12 and 16). In this case, the received data acquisition controlling means controls the acquisition processing for the data in accordance with an instruction from the user confirmation processing unit.